

ANNUAL MONITORING REPORT FOR 1991

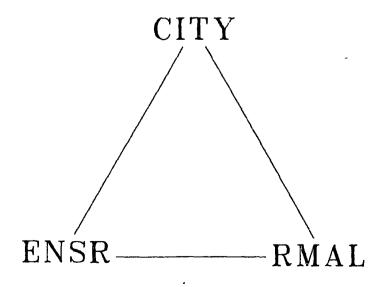
REILLY TAR & CHEMICAL CORP.

N.P.L. SITE

ST. LOUIS PARK, MINNESOTA

SUBMITTED MARCH 16, 1992

ANNUAL MONITORING REPORT
FOR 1991
REILLY TAR & CHEMICAL CORP.
N.P.L. SITE
ST. LOUIS PARK, MINNESOTA
SUBMITTED MARCH 16, 1992
(INCLUDES APPENDICES A-C)





CERTIFIED MAIL RETURN RECEIPT REQUESTED

March 16, 1992

Regional Administrator
United States Environmental
Protection Agency, Region 5
ATTN: Darryl Owens
Mail Code 5HS-11
230 South Dearborn Street
Chicago, Illinois 60604

Director, Solid and Hazardous
Waste Division
Minnesota Pollution Control Agency
ATTN: Site Response Section
520 Lafayette Road North
St. Paul, Minnesota 55155

President
Reilly Industries, Inc.
1510 Market Square Center
151 North Delaware
Indianapolis, Indiana 46204

RE: United States of America, et al. vs. Reilly Tar & Chemical Corporation, et al. File No. Civ. 4-80-469

Gentlemen:

Enclosed is the 1991 annual progress report submitted pursuant to Park K of the Consent Decree in the above captioned matter. This report is issued by the City in accordance with Section 2(a) of the Reilly/St. Louis Park Agreement (Exhibit B to the Consent Decree).

Sincerely, James N. Lhule

James N. Grube

Director of Public Works

JNG/cmr enclosure

cc: William Gregg (w/2 enclosures)
 Elizabeth Thompson (w/enclosure)
 Reilly File

ANNUAL MONITORING REPORT

FOR 1991

SUBMITTED TO THE

REGIONAL ADMINISTRATOR UNITED STATES ENVIRONMENTAL PROTECTION AGENCY REGION V

EXECUTIVE DIRECTOR
MINNESOTA POLLUTION CONTROL AGENCY

BY

THE CITY OF ST. LOUIS PARK, MINNESOTA

PURSUANT TO
CONSENT DECREE - REMEDIAL ACTION PLAN
SECTION 3.4

UNITED STATES OF AMERICA, ET AL.

VS.

REILLY TAR AND CHEMICAL CORPORATION, ET AL.

UNITED STATES DISTRICT COURT DISTRICT OF MINNESOTA CIVIL NO. 4-80-469

MARCH 16, 1992

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1.0 INTRODUCTION

Pursuant to Section 3.4 of the Consent Decree - Remedial Action Plan (CD-RAP) in the case of the United States of America, et al. vs. Reilly Tar & Chemical Corporation, et al., this report presents the results of all chemical analyses and water level measurements for calendar year 1991 that are not presented in previous reports.

The ground water monitoring conducted in 1991 was performed in accordance with the Sampling Plan submitted in October, 1990. The City of St. Louis Park has overall responsibility for conducting the ground water monitoring required by the CD-RAP. In accordance with the Sampling Plan, the City was assisted in 1991 by ENSR Consulting and Engineering who collected ground water samples from monitoring wells, and by Rocky Mountain Analytical Laboratory (RMAL) who performed the analyses for PAH and phenolics.

The 1991 monitoring data are presented separately for each aquifer that was monitored, starting with the Mt. Simon-Hinckley Aquifer, which is the deepest below the ground surface, and ending with the Drift-Platteville Aquifer, which is the uppermost aquifer monitored. A series of maps has been prepared to help present the monitoring data. Maps for the Prairie du Chien-Jordan and St. Peter Aquifers are contained in the pockets of this report.

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2.0 MT. SIMON-HINCKLEY AQUIFER

In accordance with RAP Section 5.1, four wells in the Mt. Simon-Hinckley Aquifer were sampled once in 1991. A summary of the analytical data and the water level elevations at the four wells are shown on Figure 2-1. The laboratory reports of the analytical data are included as Appendix A.

The sums of the concentrations of benzo(a) pyrene and dibenz(a,h) anthracene PAH, carcinogenic PAH, and other PAH in each well are below the drinking water criteria for these compounds. The results for all four wells are consistent with historical water quality for the aquifer. It appears that the Mt. Simon-Hinckley Aquifer has not been significantly affected by contaminants originating from the former Reilly Tar & Chemical Corporation (Reilly) site.

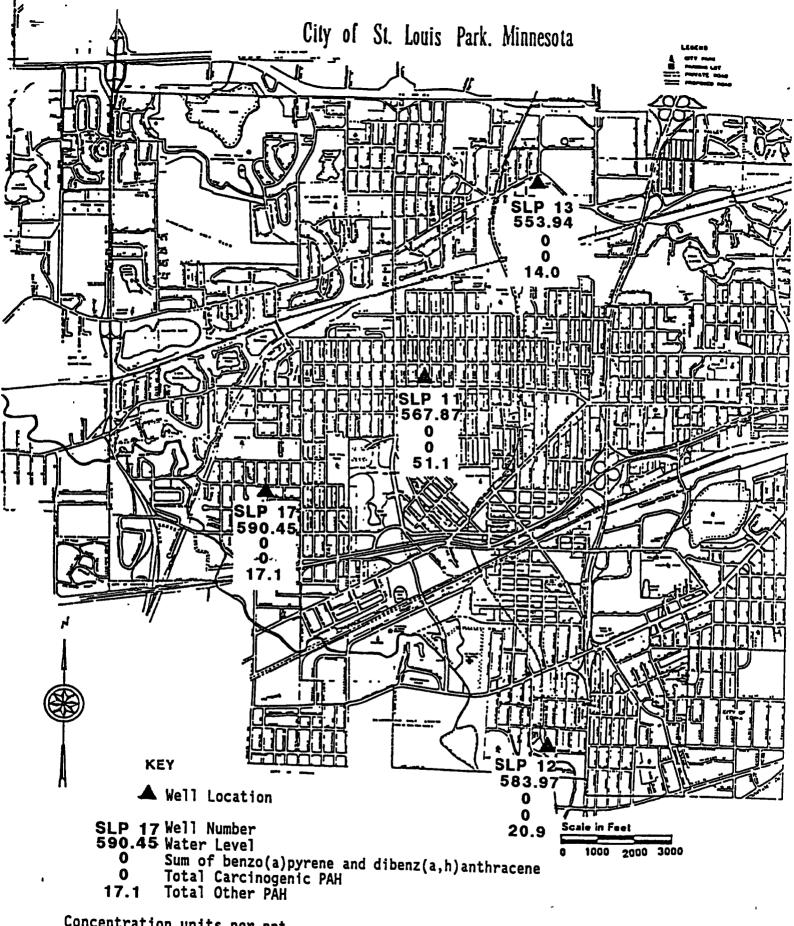


Figure 2-1 Summary of Ground Water Monitoring Results for the Mt. Simon-Hinckley Aquifer: 1991

3.0 IRONTON-GALESVILLE AQUIFER

Water quality in well W105 consistently met the criteria for discontinuing the 25 gallons per minute pumping rate, since pumping began in 1987 (Table 3-1). In accordance with the procedures given in CD-RAP Section 6.1.5, and the approval received from MPCA and U.S. EPA on December 4, 1991, well W105 ceased pumping on December 23, 1991. The water quality results for the two sampling rounds conducted in 1991 (Figures 3-1 and 3-2) indicate that the concentrations of PAH remain relatively low in well W105.

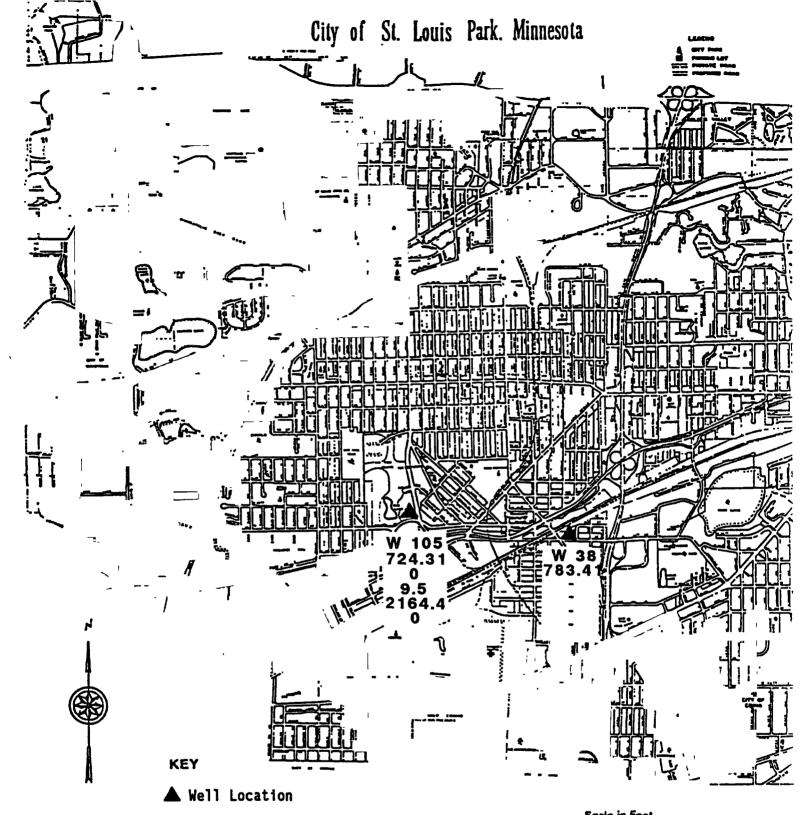
Cossation L 10 mg/l Total PAH

TABLE 3-1

Summary of Total PAH in Well W105 1988 to 1991

Sampling Date	DAU (m
February 1988	PAH (ng/i)
June 1988	9000
September 1988	2400
December 1988	3670
June 1989	2035
December 1989	1400
March 1990	1086
August 1990	2347
May 1991	2600
August 1991	2164
	1014

:



W 105 Well Number 724.31 Water Level

Sum of benzo(a)pyrene and dibenz(a,h)anthracene

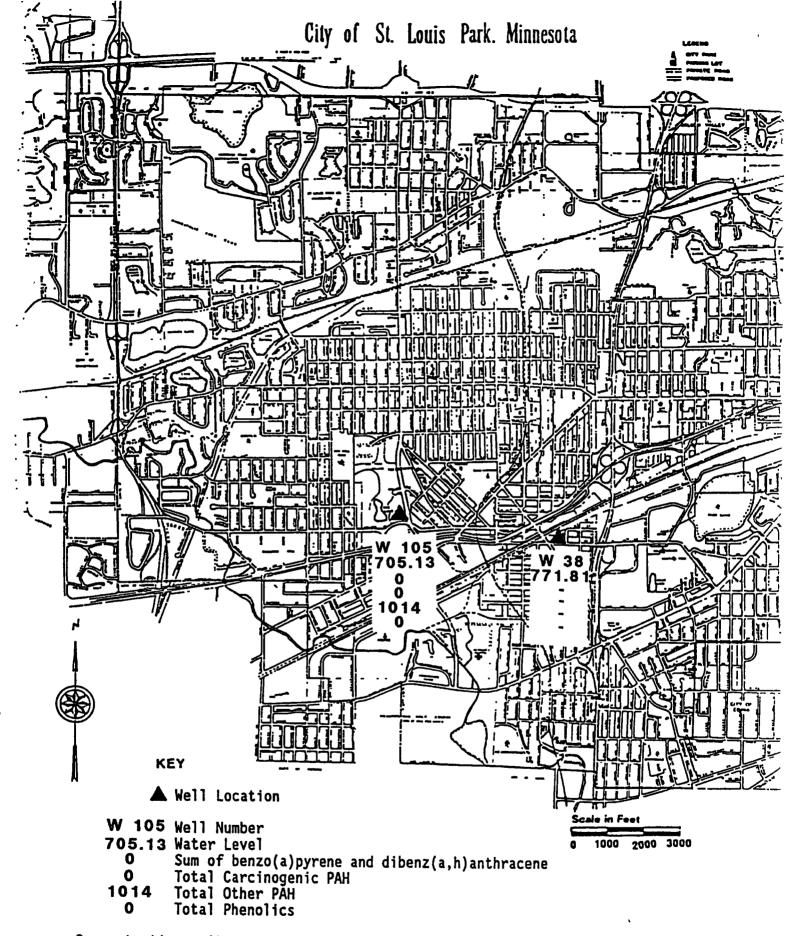
Total Carcinogenic PAH

2164.4 Total Other PAH

Total Phenolics

Concentration units per ppt Figure 3-1 Summary of Ground Water Monitoring Results for the Ironton-Galesville

Aquifer: First Half, 1991



Concentration units per ppt Figure 3-2
Summary of Ground Water

Summary of Ground Water Monitoring Results for the Ironton-Galesville Aquifer: Second Half, 1991

Cossation FER LIDUALL Total AH

4.0 PRAIRIE DUE CHIEN-JORDAN AQUIFER

In accordance with RAP Section 7.3, Prairie du Chien-Jordan Aquifer wells were monitored in 1991 at the frequency identified in the 1991 Sampling Plan. In addition to water quality monitoring, ground water elevations were measured at the Prairie du Chien-Jordan Aquifer wells during each sampling round. Wells W119, W48, and H3 were not available for sampling during 1991 because owners have taken these wells out of service.

Summaries of analytical data and ground water elevations for the sampling rounds are shown in Figures 4-1, 4-2, 4-3 and 4-4 (in pockets). The figures show that ground water flow in the aquifer is highly variable, depending on which combination of wells are pumping as measurements are made. The laboratory reports of the analytical data are presented in Appendix C. Table 4-1 presents a summary of 1989, 1990, and 1991 analytical results for Prairie du Chien-Jordan Aquifer wells. In 1991, Other PAH were detected in concentrations ranging from 12.1 ppt (well E13) to 91,200 ppt (well W23). A total of seven wells exceed the drinking water criterion for Other PAH (W23, SLP10, W402, W403, W29, W40, and W70).

The levels of total carcinogenic PAH detected range from 1.1 to 48.8 ppt; however, the levels of carcinogenic PAH in municipal drinking water wells remain below the drinking water criteria.

The results for wells W402 and W403 exceeded the drinking water criteria for PAH. Other monitoring wells between the Reilly site and wells W402 and W403 exhibit PAH levels below the drinking water criteria (e.g., see historical data for wells SLP4 and SLP6 on Table 4-1). It is not known if the apparent increase in the levels of PAH in wells W402 and W403 are related to contamination from the Reilly site.

Well W403 is located in Minnekahda Vista Park and has been subject to vandalism on at least two occasions which required cleaning debris from the well. The debris consisted of trash, beer cans, and the bumper posts uprooted from around the well. Extra care was given to redevelop and purge this well, but it is not known if at least a portion of the increase in PAH concentration in well W403 is due to the vandalism.

TABLE 4-1

Summary of Total PAH Analytical Results for Prairie Du Chien-Jordan Aquifer Wells in 1989, 1990, and 1991^a

	1989				1990			1991				
	Q1	Q2	Q3	Q4	Q1	Q2	Q 3	Q4	Q1	Q2	Q3	Q4
W23	120,200	117,600	106,300	_b	129,100	-	114,700	68	87,800	71,800	91,200	82,600
W48	•	1640	1850	1130	1690	1809	4588		-	-	-	-
SLP6	-	58	36	40	45	82	117	68	63.4	77.8	123.3	-
SLP7	-	61	25	25	43	49	93	48	50.1	37.2	64.8	-
W406	-	36	-	26	•	51	134	-	. •	31.0	41.7	-
E2	•	21	8	•	-	25	14	•	•	16.8	25	•
•												
E13	-	20	6	-	-	13	25	•	•	12.1	13	•
НЗ	•	93	370	-	-	188	5300	-	•	-	•	•
SLP15	-	4030	•	-	•	-	-	-	•	•	•	-
SLP10	-	-	-	5120	•	5403	7386		-	320.5	4370	-
SLP14	•	134	84	-	98	-	145	•	-	100	18.9	-
SLP16	•	28	24	•	•	•	-	59	•	33.5	64	-
W402	-	•	•	151	•	767	149	-	•	514	18,320	-
W403	•	1020	177	•	-	-	1150		•	1086	11,570	-

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TABLE 5-1
...
Summary of Total PAH Analytical Results for St. Peter Aquifer Wells in 1989, 1990, and 1991*

1989			90	1991		
First Round (June)	Second Round (October)	First Round (June)	Second Round (August)	First Round (April)	Second Round (August)	
9.6	15	33	19	.b	24	
-	•	•	-	4023	4160	
•	-	•	290	17,912	9921	
163	2246	990	133	796	863	
601	40	143	96	190	430	
37,870	21,370	19,448	14,030	2591	4610	
150	110	24	158	, 358	1188	
630	830	141	243	360	3833	
208	460	466	336	408	251	
226	130	•	485	1524	5283	
83	43	-	22	61	42	
425	360	•	•	85	5330	
	First Round (June) 9.6 - 163 601 37,870 150 630 208	First Round (June) 9.6 15 163 2246 601 40 37,870 21,370 150 110 630 830 208 460 226 130 83 43	First Round (June) Second Round (October) First Round (June) 9.6 15 33 - - - - - - 163 2246 990 601 40 143 37,870 21,370 19,448 150 110 24 630 830 141 208 460 466 226 130 - 83 43 -	First Round (June) Second Round (October) First Round (June) Second Round (August) 9.6 15 33 19 - - - - - - - - 163 2246 990 133 601 40 143 96 37,870 21,370 19,448 14,030 150 110 24 158 630 830 141 243 208 460 466 338 226 130 - 485 83 43 - 22	First Round (June) Second Round (June) First Round (August) First Round (April) 9.6 15 33 19 -b - - - - 4023 - - - 290 17,912 163 2246 990 133 796 601 40 143 96 190 37,870 21,370 19,448 14,030 2591 150 110 24 158 358 630 830 141 243 360 208 460 466 336 408 226 130 - 485 1524 83 43 - 22 61	

a Results presented are the sum of carcinogenic PAH and other PAH in parts per infilion (ng/l)

b - signifies not sampled

The relative occurrence of individual PAH does not appear to represent any form of trend or pattern. For example, dibenzothiophene found in well W408 at a concentration of 270 parts per trillion during the second round has not been detected in well W409 during the last five sampling rounds. This is unexpected given that the direction of contaminant migration is from the area of well W409 toward well W408.

The 1991 analytical results for well W412 are approximately one order of magnitude higher than the results from the previous two years. This well is relatively close to well W133, which has historically had the highest total PAH concentrations monitored in the St. Peter Aquifer. There is no apparent cause for the large decrease in total PAH concentration at well W133 coupled with the large increase at well W412.

The increase in total PAH concentration at well W410 is probably explained by the operation of this well to control the hydraulic gradient in the St. Peter Aquifer. This well is expected to control the flow of ground water through the area of the aquifer represented by the water quality in wells such as W33 and W24. The total PAH concentrations in well W410 may increase to over 10,000 parts per trillion in response to the operation of the well.

In conclusion, the extreme variability in the 1991 sampling results for the St. Peter Aquifer prevent a clear interpretation of the current extent of contamination, or of water quality changes in the aquifer. The operation of well W410 does appear to be effective in controlling the flow of ground water as evidenced by the 1991 water quality changes, and the water level contours shown in Figures 5-1 and 5-2. Continued monitoring in accordance with the 1992 Sampling Plan is needed to further evaluate water quality in the St. Peter Aquifer.

6.0 DRIFT-PLATTEVILLE AQUIFER

The ground water monitoring for the Drift-Platteville Aquifer in 1991 consisted of quarterly PAH and phenolics monitoring of wells W420, W421, and W422, the Drift-Platteville Aquifer source and gradient control wells. Wells W420, W421, and W422 have been monitored quarterly since they began pumping in 1987. The monitoring data are presented on Figures 6-1, 6-2, 6-3, and 6-4. The laboratory reports of the analytical data are included in Appendix E.

The PAH and phenolic data are summarized in Table 6-1. Table 6-1 shows that near the source of contamination, PAH concentrations in ground water are consistently in the range of several hundred micrograms per liter to low milligrams per liter. The trends of these data suggests that while contaminant levels have fluctuated approximately 10 percent in the past three years, the overall levels can be described as stable.

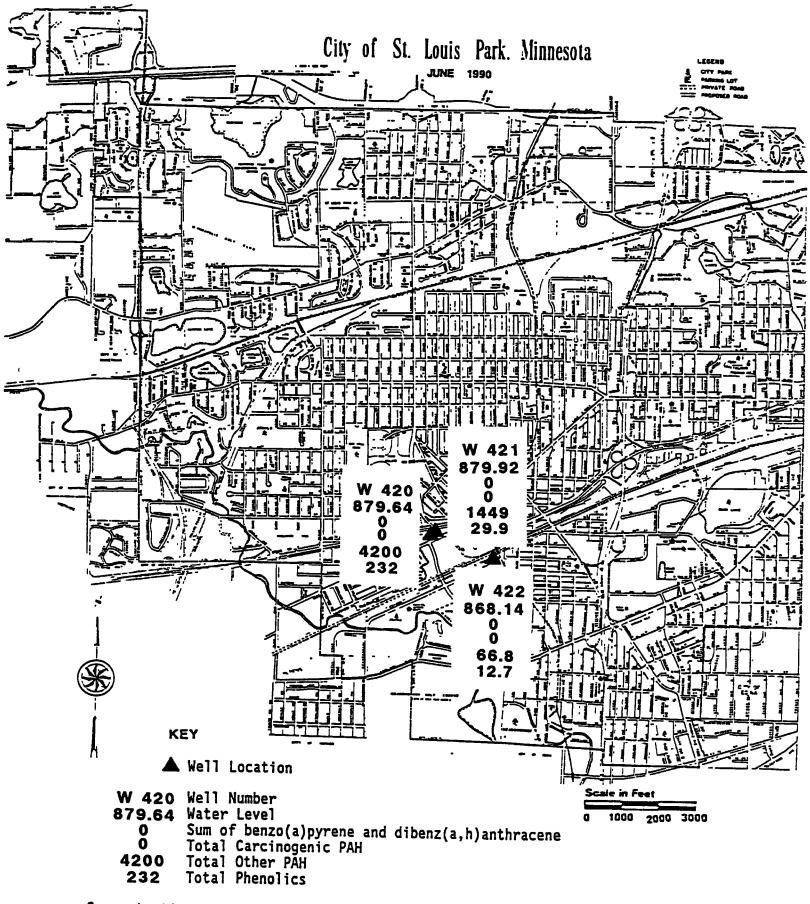


Figure 6-1
Summary of Ground Water Monitoring
Results for the Drift-Platteville Aquifer
First Quarter, 1991

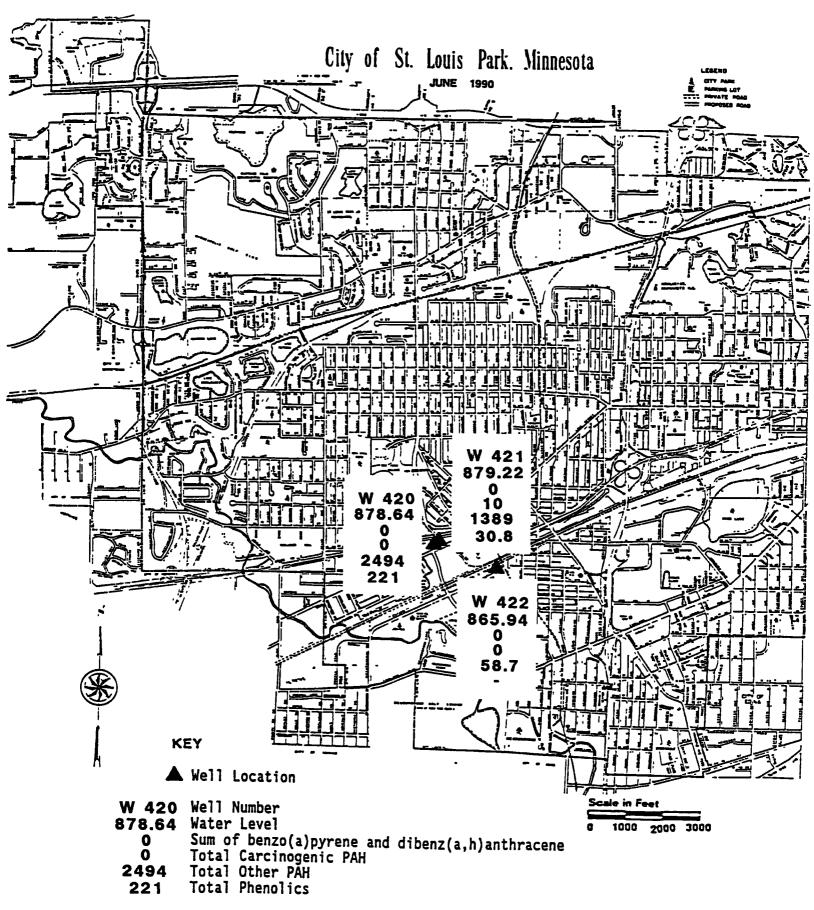


Figure 6-2
Summary of Ground Water Monitoring
Results for the Drift-Platteville Aquifer
Second Quarter, 1991

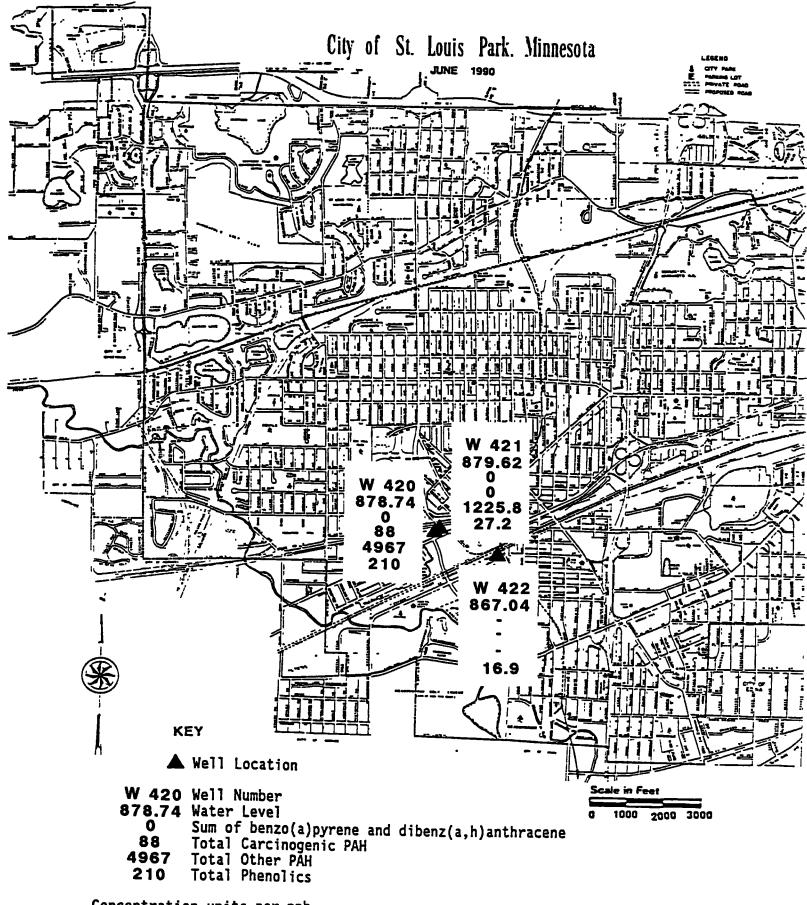


Figure 6-3
Summary of Ground Water Monitoring
Results for the Drift-Platteville Aquifer
Third Quarter, 1991

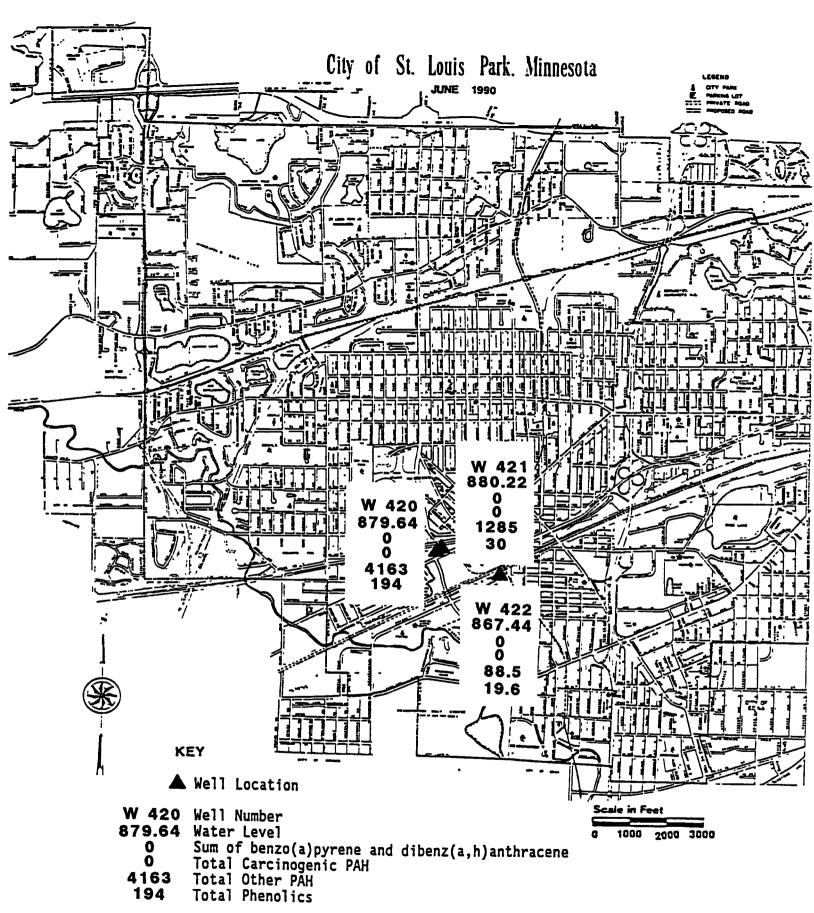


Figure 6-4
Summary of Ground Water Monitoring
Results for the Drift-Platteville Aquifer
Fourth Quarter, 1991

TABLE 6-1

Summary of Analytical Resuls for W420, W421, and W422 1988 through 1991

Date	Total PAH (#g/t)	Phenois
W420		(#g/t)
August 1988	4200	200
October 1988	1100	200
March 1989	2400	44 120
June 1989	3400	
September 1989	3400	130 220
December 1989	3400	110
March 1990	3950	240
May 1990	2430	230
August 1990	3150	230
December 1990	3030	230
March 1991	4200	230
June 1991	2500	220
September 1991	5000	210
October 1991	4200	190
W421		
August 1988	760	
October 1988	1100	300
March 1989		35
June 1989	880	30
September 1989	1000	30
December 1989	1000	35
March 1990	730	30
May 1990	1420	35
August 1990	715	30
December 1990	1410	40
March 1991	1145	30
June 1991	1400	30
	1400	31

TABLE 6-1

Summary of Analytical Resuls for W420, W421, and W422 1988 through 1991

Date	Total PAH (μg/ℓ)	Phenois (#g/t)
September 1991	1200	27
October 1991	1300	30
W422		
August 1988	77	24
October 1988	50	14
March 1989	50	10
June 1989	50	15
September 1989	60	20
December 1989	50	15
March 1990	75	20
May 1990	60	15
August 1990	90	15
December1990	60	20
April 1991	59	_b
September 1991	-	17
October 1991	88	18

a. Total PAH is the sum of carcinogenic PAH and other PAH

b. - signifies not sampled

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			,
			•
-		ř	

APPENDIX A

LABORATORY DATA SUMMARY PACKAGE: MT. SIMON-HINCKLEY AQUIFER

MOUNT SIMON-HINCKLEY AQUIFER PAH QUALITY CONTROL SUMMARY

Well <u>No.</u>	Sample <u>Date</u>	Method Blank	Field Duplicate	<u>Matrix Spike</u>	<u>Matrix Spike Dup</u>	<u>Field Blank</u>
SLP11	03/27/91	14223-BLK01	PCJ-SLP6D-032791	PCJ-SLP6MS-032791	PCJ-SLP6MSD-032791	PCJ-SLP6FB-032791
SLP12	03/27/91	14223-BLK01	PCJ-SLP6D-032791	PCJ-SLP6MS-032791	PCJ-SLP6MSD-032791	PCJ-SLP6FB-032791
SLP13	03/27/91	14223-BLK01	PCJ-SLP6D-032791	PCJ-SLP6MS-032791	PCJ-SLP6MSD-032791	PCJ-SLP6FB-032791
SLP17	03/27/91	14223-BLK01	PCJ-SLP6D-032791	PCJ-SLP6MS-032791	PCJ-SLP6MSD-032791	PCJ-SLP6FB-032791



CASE NARRATIVE

FOR

City of St. Louis Park

May 2, 1991

Enseco - RMAL Project Number 014223

Introduction

Thirteen aqueous samples (including MS and MSD) were received at Enseco - Rocky Mountain Analytical Laboratory on March 28, 1991. The samples were logged in under RMAL project number 014223. Sample PCJ-SLP6FBD-032791 (RMAL # 014223-05) was extracted and held as per the QAPP. A cross reference associating the RMAL sample numbers to the actual field sample numbers is included. The samples were analyzed for low and medium level part-pertrillion (PPT) polynuclear aromatic hydrocarbons (PAH).

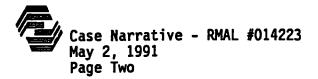
Data Quality Assessment

The results contained in this report were reviewed relative to data acceptance criteria as specified in the 1990 QAPP for completeness, precision, accuracy, representativeness and defensibility of the data. Unless otherwise stated below, no quality control problems or technical difficulties were encountered which would impact the interpretation or use of data in this report.

PPT PAH

All the samples and the associated method blank BLKO1 show target compounds that do not meet secondary ion confirmation criteria. In some instances a compound that does not meet secondary ion confirmation criteria may still be determined to be present in the sample after close inspection of the data by the analyst. Supportive data includes mass chromatograms maxima at the same scan for primary and secondary ions, as well as discernible quantitation interference with the secondary ion. These compounds are flagged with asterisk (*) on the data sheets (Form I) as per the 1990 QAPP.

Enseco Incorporated 4955 Yarrow Street Arvada, Colorado 80002 303/421-6611 Fax: 303/431-7171



This data package is in compliance with the terms and conditions of the 1990 QAPP, both technically and for completeness, for other than the conditions detailed above.

Reported by:

-3/DCUL DYUZ Tracy Commov Date: 05-02-91

Approved by:

But 2 tall for

Date: 2 may 1991

Joel Holtz Program Administrator

Data Control Supervisor



Qualifier Codes and their Usage

- U = Indicates compound was analyzed for but not detected. The sample quantitation limit is corrected for dilution and for percent moisture. For soil samples subjected to GPC clean-up procedures, the CRQL (contract required quantitation limit) is multiplied by two to account for the fact that only half of the extract is recovered.
- J = Indicates an estimated value. This flag is used when the mass spectral data indicates the presence of a compound that meets the identification criteria but the result is less than the sample quantitation limit but greater than zero.
- B = This flag is used when the analyte is found in the associated blank as well as in the sample. B codes do not necessarily invalidate the data but are dependent upon the judgement of the reviewer in applying the validation guidelines. This flag is used for a TIC as well as for a positively identified target compound list (TCL) compound.
- E = This flag identifies compounds whose concentrations exceed the calibration range of the GC/MS instrument for that specific analysis.
- D = This flag identifies all compounds identified during a re-analysis of a diluted sample.
- A = This flag indicates that a TIC is a suspected aldol-condensation product.



SAMPLE DESCRIPTION INFORMATION for City of St. Louis Park

			Sampl	ed	Received
Lab ID	Client ID	Matrix	Date	Time	Date
014223-0001-SA	PCJ-SLP7-032791	AQUEOUS	27 MAR 91		28 MAR 91
014223-0002-SA	PCJ-SLP8-032791	AQUEOUS	27 MAR 91		28 MAR 91
014223-0003-SA	MSH-SLP13-032791	AQUEOUS	27 MAR 91		28 MAR 91
014223-0004-FB	PCJ-SLP6FB-032791	AQUEOUS	27 MAR 91		28 MAR 91
014223-0005-FD	PCJ-SLP6FBD-032791	AQUEOUS	27 MAR 91		28 MAR 91
014223-0006-SA	PCJ-SLP6-032791	AQUEOUS	27 MAR 91		28 MAR 91
014223-0006-MS	PCJ-SLP6MS-032791	AQUEOUS	27 MAR 91		28 MAR 91
014223-0006-SD	PCJ-SLP6MSD-032791	AQUEOUS	27 MAR 91		28 MAR 91
014223-0007-SA	PCJ-SLP6D-032791	AQUEOUS	27 MAR 91		28 MAR 91
014223-0008-SA	IGV-WI05-032791	AQUEOUS	27 MAR 91		28 MAR 91
014223-0009-SA	MSH-SLP11-032791	AQUEOUS	27 MAR 91		28 MAR 91
014223-0010-SA	MSH-SLP17-032791	AQUEOUS	27 MAR 91		28 MAR 91
014223-0011-SA	MSH-SLP12-032791	AQUEOUS	27 MAR 91		28 MAR 91

1B

EPA SAMPLE NO.

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

14223-03

Lab Name: ENSECO-RMAL

Contract No.:

Lab Code: ENSECO Case No.: 14223 SAS No.: SDG No.:

Matrix: (soil/water) WATER Lab Sample ID: 14223-03

Sample wt/vol: 3860 (g/ml) ML Lab File ID: X2970

Level: (low/med) LOW Date Received: 03/28/91

% Moisture: not dec. dec. Date Extracted: 03/31/91

Extraction: (SepF/Cont/Sonc) CONT Date Analyzed: 04/10/91

GPC Cleanup: (Y/N) N pH: 7.0 Dilution Factor: 0.130

CONCENTRATION UNITS: NG/L

CAS NO	COMPOUND	0.000	Q
	9-62,3-Benzofuran	5.1	U
496-11	L-72,3-Dihydroindene	2.1	
95-13	3-61H-Indene	0.9	U
91-20)-3Naphthalene	4.8	JB*
4565-32	2-6Benzo(B)Thiophene	0.9	υ
	2-5Quinoline	1.5	บ
120-72	2-91H-Indole	2.6	บ
91-57	7-62-Methylnaphthalene	3.0	В
90-12	2-01-Methylnaphthalene	1.3	JB*
92-52	2-4Biphenyl 5-8Acenaphthylene	4.4	U
208-96	5-8Acenaphthylene	1.5	ט
83-32	2-9Acenaphthene	1.3	U
132-64	-9Dibenzofuran	1.0	U
86-73	3-7Fluorene	1.0	ע
132-65	5-0Dibenzothiophene	1.1	ע
85-01	-8Phenanthrene	ì.3	J
120-12	2-7Anthracene	1.1	ד
260-94	I-6Acridine · ∣	3.0	υ
86-74	-8Carbazole	2.0	U
206-44	-0Fluoranthene	1.5	บ
129-00)-0Pyrene	1.5	*
56-55	5-3Benzo(A)Anthracene	2.6	U
218-01	-9Chrysene	2.9	Ŭ
205-99	-2Benzo(B) Fluoranthene	2.6	Ū
	3-9Benzo(K)Fluoranthene	2.4	Ū
192-97	-2Benzo(E) Pyrene	2.0	Ū
50-32	2-8Benzo(A)Pvrene	2.4	บ
198-55	5-0Pervlene	2.6	บ
193-39	-0Perylene -5Indeno(1,2,3-CD)Pyrene	2.2	ប
53-70	-3Dibenz(A,H)Anthracene	1.7	Ū
191-24	-2Benzo(G,H,I)Perylene	2.9	บ

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1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

14223-09

Lab Name: ENSECO-RMAL Contract No.:

Lab Code: ENSECO Case No.: 14223 SAS No.: SDG No.:

Matrix: (soil/water) WATER Lab Sample ID: 14233-09

Sample wt/vol: 4100 (g/ml) ML Lab File ID: X2974

Date Received: 03/28/91 Level: (low/med) LOW

Date Extracted: 03/31/91 % Moisture: not dec. dec.

Extraction: (SepF/Cont/Sonc) CONT Date Analyzed: 04/10/91

Dilution Factor: 0.122 GPC Cleanup: (Y/N) N pH: 7.0

CONCENTRATION UNITS: NG/L

CAS NO. COMPOUND Q 271-89-6----2,3-Benzofuran 5.0 U 496-11-7----2,3-Dihydroindene_ 3.5 95-13-6----1H-Indene 4.7 91-20-3----Naphthalene 30 В 4565-32-6----Benzo(B) Thiophene_ 1.8 91-22-5----Quinoline U 1.4 120-72-9----1H-Indole U 2.4 91-57-6----2-Methylnaphthalene 2.3 В 90-12-0----1-Methylnaphthalene 3.2 B* 92-52-4----Biphenyl 4.2 U 208-96-8-----Acenaphthylene 1.4 U *- -1-6-83-32-9----Acenaphthene 132-64-9-----Dibenzofuran_ U 1.0 86-73-7----Fluorene_ 1.0 U U 132-65-0-----Dibenzothiophene 1.1 85-01-8-----Phenanthrene 1.4 120-12-7-----Anthracene 1.1 U U 260-94-6-----Acridine 2.8 U 86-74-8-----Carbazole 1.9 1.1 J 206-44-0----Fluoranthene 129-00-0----Pyrene 1.5 56-55-3----Benzo(A)Anthracene 2.4 U 218-01-9----Chrysene 2.7 U 205-99-2----Benzo(B) Fluoranthene U 2.4 207-08-9----Benzo(K) Fluoranthene U 2.2 U 192-97-2----Benzo(E) Pyrene 1.9 50-32-8-----Benzo(A) Pyrene 2.2 U 198-55-0----Perylene U 2.4 U 193-39-5----Indeno(1,2,3-CD) Pyrene 2.0 U 53-70-3----Dibenz(A,H)Anthracene 1.6 U 191-24-2----Benzo(G,H,I)Perylene 2.7

EPA SAMPLE NO.

1B SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

14223-10

Lab Name: ENSECO-RMAL

Contract No.:

Lab Code: ENSECO Case No.: 14223 SAS No.: SDG No.:

Matrix: (soil/water) WATER Lab Sample ID: 14233-10

Sample wt/vol: 4200 (g/ml) ML Lab File ID: X2975

Date Received: 03/28/91 Level: (low/med) LOW

% Moisture: not dec. dec. Date Extracted: 03/31/91

Extraction: (SepF/Cont/Sonc) CONT Date Analyzed: 04/10/91

GPC Cleanup: (Y/N) N pH: 7.0 Dilution Factor: 0.119

CONCENTRATION UNITS: NG/L

CAS NO. COMPOUND		Q
271-89-62,3-Benzofuran	4.8	ט
496-11-72,3-Dihydroindene	1.4	
95-13-61H-Indene		ן ט
91-20-3Naphthalene		В
4565-32-6Benzo(B) Thiophene	0.9	ט
91-22-5Quinoline	1.3	ן ט
120-72-91H-Indole		ע
91-57-62-Methylnaphthalene	3.2	B*
90-12-01-Methylnaphthalene	1.4	JB*
92-52-4Biphenyl	4.1	ן ט
208-96-8Acenaphthylene	1.3	U
83-32-9Acenaphthene	1.2	ប
132-64-9Dibenzofuran	1.0	Ū
86-73-7Fluorene	1.0	ប
132-65-0Dibenzothiophene	1.0	ט
85-01-8Phenanthrene	1.8	*
120-12-7Anthracene	1.0	ט
260-94-6Acridine	2.8	ט
86-74-8Carbazole	1.8	ט
206-44-0Fluoranthene	1.2	J
129-00-0Pyrene	1.8	
56-55-3Benzo(A) Anthracene	2.4	ט
218-01-9Chrysene	_ 2.7	ט
205-99-2Benzo(B) Fluoranthene	_ 2.4	Ū
207-08-9Benzo(K)Fluoranthene	2.2	ט
192-97-2Benzo(E) Pyrene	1.8	ע
50-32-8Benzo (A) Pyrene	2.2	U
198-55-0Perylene	2.4	ט
193-39-5Indeno(1,2,3-CD)Pyrene	2.0	ט
53-70-3Dibenz(A,H)Anthracene	1.5	ן ט
191-24-2Benzo(G,H,I)Perylene	2.7	ט

1

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

14223-11

Lab Name: ENSECO-RMAL Contract No.:

Lab Code: ENSECO Case No.: 14223 SAS No.: SDG No.:

Matrix: (soil/water) WATER Lab Sample ID: 14233-11

Sample wt/vol: 4000 (g/ml) ML Lab File ID: X2976

Level: (low/med) LOW Date Received: 03/28/91

% Moisture: not dec. dec. Date Extracted: 03/31/91

Extraction: (SepF/Cont/Sonc) CONT Date Analyzed: 04/10/91

GPC Cleanup: (Y/N) N pH: 7.0 Dilution Factor: 0.125

CONCENTRATION UNITS: NG/L

CAS NO.	COMPOUND	N ONIIS. NG/L	Q
271-89-6	2,3-Benzofuran_	5.1	Ū
496-11-7	2,3-Dihydroindene	1.3	J
95-13-6	1H-Indene	0.9	U
91-20-3	Naphthalene	7.5	B*
4565-32-6	Benzo(B)Thiophene	0.9	ן ט
91-22-5	Quinoline	1.4	ט
120-72-9	1H-Indole	2.1	J *
91-57-6	2-Methylnaphthalene	5.3	В
90-12-0	1-Methylnaphthalene	2.3	B*
92-52-4	Biphenyl	4.3	ן ט
208-96-8	Acenaphthylene	1.4	U
83-32-9	Acenaphthene		ט
132-64-9	Dibenzofuran	1.0	ן ד
	Fluorene	1.0	ן ט
132-65-0	Dibenzothiophene	1.1	ן ט
85-01-8	Phenanthrene	1.3	ן ט
120-12-7	Anthracene	1.1	ן ט
260-94-6	Acridine	2.9	U
86-74-8	Carbazole	1.9	U
206-44-0	Fluoranthene	1.0	J
129-00-0	Pyrene	1.4	
	Benzo(A)Anthracene		ט
218-01-9	Chrysene	2.8	U
	Benzo(B)Fluoranthene	2.5	ן ט
207-08-9	Benzo(K)Fluoranthene	2.3	U
192-97-2	Benzo(E)Pyrene	1.9	υ
50-32-8	Benzo(A)Pyrene	1 , 2.3	U
198-55-0	Perylene Indeno(1,2,3-CD)Pyrene	2.5	ט
193-39-5	Indeno(1,2,3-CD)Pyrene	2.1	ט
53-70-3	Dibenz(A,H)Anthracene	1.6	ט
191-24-2	Benzo(G,H,I)Perylene	2.8	ט

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APPENDIX B

LABORATORY DATA SUMMARY PACKAGE: IRONTON-GALESVILLE AQUIFER

IRONTON-GALESVILLE AQUIFER PAH QUALITY CONTROL SUMMARY

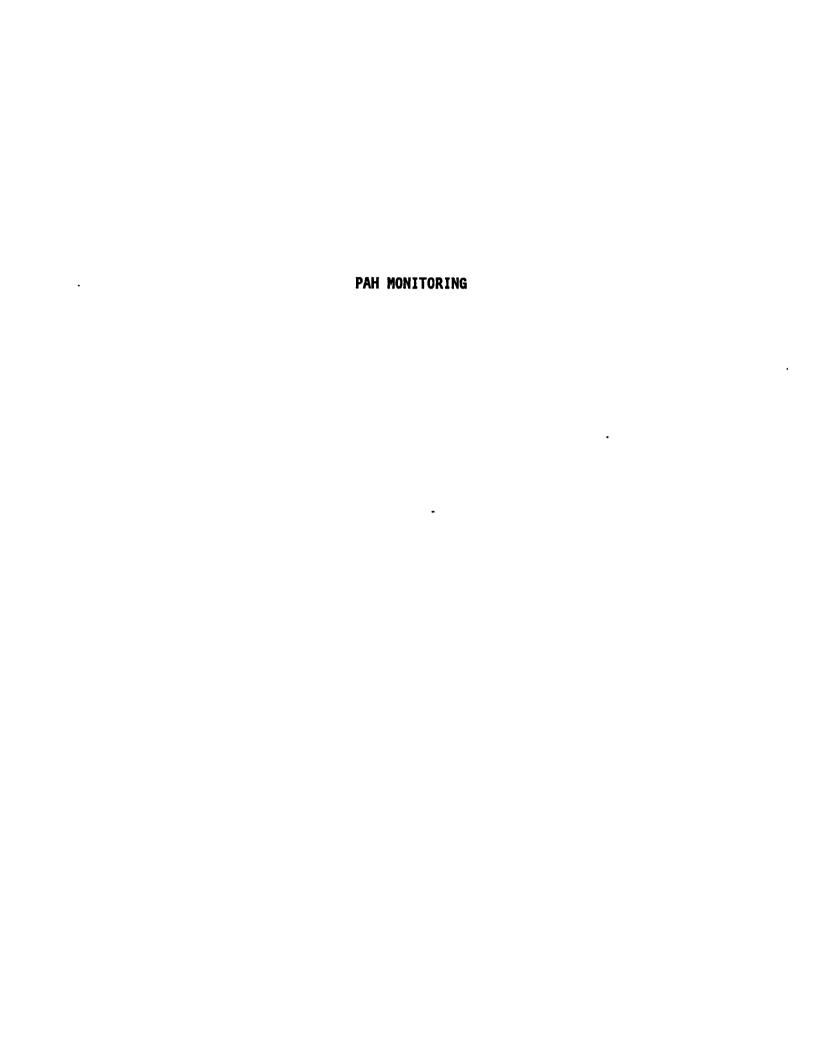
Well <u>No.</u>	Sample <u>Date</u>	Method Blank	Field Duplicate	<u>Matrix Spike</u>	Matrix Spike Dup	<u>Field Blank</u>
W105	03/27/91	14223-BLK03	PCJ-SLP6D-032791	PCJ-SLP6MS-032791	PCJ-SLP6MSD-032791	PCJ-SLP6FB-032791
W105	05/01/91	14781-BLK01	IGV-W105D-050191	/		IGV-W105FB-050191
W105	08/28/91	16727-BLK02	STP-SLP3D-082891	PCJ-SLP6MS-082891	PCJ-SLP6MSD-082891	STP-SLP3FB-082891

PHENOLICS QUALITY CONTROL SUMMARY

Well No.	Sample <u>Date</u>	Method Blank	Field Duplicate	Matrix Spike	<u>Matrix Spike Dup</u>	<u>Field Blank</u>
W105	03/28/91	14236-BLK	DPV-W422TPD-032891	DPV-W422TPMS-032891	DPV-W422TPMSD-032891	DPV-W422TPFB-032891
W105	06/27/91	15612-BLK	DPV-W421TPD-062791	DPV-W421TPMS-062791	DPV-W421TPMSD-062791	DPV-W422TPFB-062791
W105	09/18/91	17193-BLK	DPV-W420TPD-091891	DPV-W420TPMS-091891	DPV-W420TPMSD-091891	DPV-W420TPFB-091891

RAP SECTION 6.1.4. MONITORING

1ST QUARTER - 1991





CASE NARRATIVE

FOR

City of St. Louis Park

May 2, 1991

Enseco - RMAL Project Number 014223

Introduction

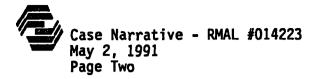
Thirteen aqueous samples (including MS and MSD) were received at Enseco - Rocky Mountain Analytical Laboratory on March 28, 1991. The samples were logged in under RMAL project number 014223. Sample PCJ-SLP6FBD-032791 (RMAL # 014223-05) was extracted and held as per the QAPP. A cross reference associating the RMAL sample numbers to the actual field sample numbers is included. The samples were analyzed for low and medium level part-pertrillion (PPT) polynuclear aromatic hydrocarbons (PAH).

Data Quality Assessment

The results contained in this report were reviewed relative to data acceptance criteria as specified in the 1990 QAPP for completeness, precision, accuracy, representativeness and defensibility of the data. Unless otherwise stated below, no quality control problems or technical difficulties were encountered which would impact the interpretation or use of data in this report.

PPT PAH

All the samples and the associated method blank BLK01 show target compounds that do not meet secondary ion confirmation criteria. In some instances a compound that does not meet secondary ion confirmation criteria may still be determined to be present in the sample after close inspection of the data by the analyst. Supportive data includes mass chromatograms maxima at the same scan for primary and secondary ions, as well as discernible quantitation interference with the secondary ion. These compounds are flagged with asterisk (*) on the data sheets (Form I) as per the 1990 QAPP.



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This data package is in compliance with the terms and conditions of the 1990 QAPP, both technically and for completeness, for other than the conditions detailed above.

Reported by:

Tracy Communication

Date: 05-02-91

Data Control Supervisor

Approved by:

Date: 2 may 1991

Program Administrator



Qualifier Codes and their Usage

- U = Indicates compound was analyzed for but not detected. The sample quantitation limit is corrected for dilution and for percent moisture. For soil samples subjected to GPC clean-up procedures, the CRQL (contract required quantitation limit) is multiplied by two to account for the fact that only half of the extract is recovered.
- J = Indicates an estimated value. This flag is used when the mass spectral data indicates the presence of a compound that meets the identification criteria but the result is less than the sample quantitation limit but greater than zero.
- B = This flag is used when the analyte is found in the associated blank as well as in the sample. B codes do not necessarily invalidate the data but are dependent upon the judgement of the reviewer in applying the validation guidelines. This flag is used for a TIC as well as for a positively identified target compound list (TCL) compound.
- E = This flag identifies compounds whose concentrations exceed the calibration range of the GC/MS instrument for that specific analysis.
- D = This flag identifies all compounds identified during a re-analysis of a diluted sample.
- A = This flag indicates that a TIC is a suspected aldol-condensation product.



SAMPLE DESCRIPTION INFORMATION for City of St. Louis Park

			Sampled	Received
Lab ID	Client ID	Matrix	Date Time	Date
014223-0001-SA 014223-0002-SA 014223-0003-SA 014223-0004-FB 014223-0006-SA 014223-0006-SA 014223-0006-SD 014223-0007-SA 014223-0008-SA 014223-0009-SA 014223-0010-SA	PCJ-SLP7-032791 PCJ-SLP8-032791 MSH-SLP13-032791 PCJ-SLP6FB-032791 PCJ-SLP6FBD-032791 PCJ-SLP6-032791 PCJ-SLP6MS-032791 PCJ-SLP6MSD-032791 PCJ-SLP6D-032791 IGV-WI05-032791 MSH-SLP11-032791	AQUEOUS	27 MAR 91 27 MAR 91	28 MAR 91 28 MAR 91
014223-0011-SA	MSH-SLP12-032791	AQUEOUS	27 MAR 91	28 MAR 91

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

14223-08

Lab Name: ENSECO-RMAL Contract No.:

Lab Code: ENSECO Case No.: 14223 SAS No.: SDG No.:

Matrix: (soil/water) WATER Lab Sample ID: 14223-08

Sample wt/vol: 500 (g/ml) ML Lab File ID: X2982

Level: (low/med) MED Date Received: 03/28/91

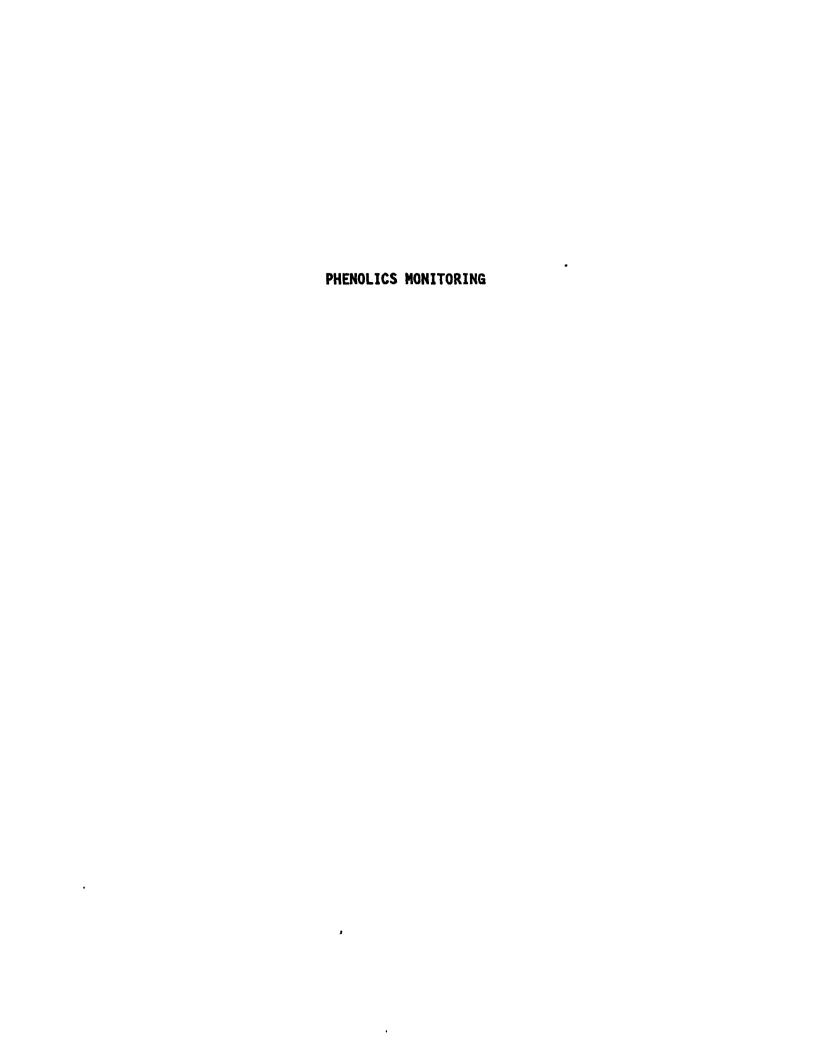
% Moisture: not dec. dec. Date Extracted: 04/01/91

Extraction: (SepF/Cont/Sonc) CONT Date Analyzed: 04/11/91

GPC Cleanup: (Y/N) N pH: 7.0 Dilution Factor: 10.0

CONCENTRATION UNITS: NG/L

CAS N	NO. COMPOUND	·	Q
271-8	39-62,3-Benzofuran	410	U
496-1	L1-72,3-Dihydroindene		
	L3-61H-Indene		
91-2	20-3Naphthalene		J *
4565-3	32-6Benzo(B)Thiophene	<u> </u>	
91-2	22-5Quinoline		U
120-7	72-91H-Indole	<u> </u>	ט
91-5	57-62-Methylnaphthalene	<u> </u>	บ
90-1	L2-01-Methylnaphthalene	320	
92-5	52-4Biphenyl	340	U
208-9	96-8Acenaphthylene	110	U
83-3	32-9Acenaphthene	<u> </u>	1
132-6	54-9Dibenzofuran	<u> </u>	บ
86-7	73-7Fluorene	80	ן ט
132-6	55-0Dibenzothiophene	88	U
85-0)1-8Phenanthrene	100	ט
120-1	L2-7Anthracene	_ 88	U
260-9	94-6Acridine	230	ע
86-7	74-8Carbazole	150	ן ט
206-4	44-0Fluoranthene	110	ַ
129-0)0-0Pyrene	110	ט
56-5	55-3Benzo(A) Anthracene	200	ט
218-0)1-9Chrysene	220	ט
205-9	99-2Benzo(B)Fluoranthene	200	ע
207-0	08-9Benzo(K)Fluoranthene	180	U
192-9	97-2Benzo(E) Pyrene	150	U
50-3	32-8Benzo(A)Pyrene	l 180	U
198-5	55-0Perylene	200	U
193-3	55-0Perylene 39-5Indeno(1,2,3-CD)Pyrene	170	บ
53-7	70-3Dibenz(A,H)Anthracene	130	Ū
191-2	24-2Benzo(G,H,I)Perylene	220	ប





April 24, 1991

Mr. James Grube City of St. Louis Park 5005 Minnetonka Blvd. St. Louis Park, MN 55416

Dear Mr. Grube:

Enclosed is the report for ten aqueous samples (including QC) received at Enseco-Rocky Mountain Analytical Laboratory on March 29, 1991.

If you have any questions, please do not hesitate to call.

Sincerely,

Joel E. Holtz

Program Administrator

JH/dk

RMAL #14236

U.S.EPA - CLP

COVER PAGE - INORGANIC ANALYSES DATA PACKAGE

0000001

Lab Name:	ROCKY MOUN	TAIN ANALYTICA	<u>AL</u> Contract	:	
Lab Code:	ENSECO	Case No.:	SAS No.:	SDG	No.:
SOW No:	7/88				
	EPA Samp 1423601 1423602 1423603 1423603 1423604 1423605 1423606 1423607 1423608		Lab Sample DPV-W420TP- DPV-W421TP- DPV-W422TP- DPV-W422TPM DPV-W422TPM DPV-W422TPD DPV-W422TPF DPV-W422TPF PCV-W23TP-0 IGV-W10STP-	032891 032891 032891 SD-032891 S-032891 B-032891 BD-032891 032891	- - -
	ers <u>Me</u> NOLS 4		Detection Limits 5 ug/L		Source 1
Comment FIVE W	ATER SAMPLES	FOR PPB PHEN	OLS ANALYSIS.		
	_	Chemical Analy	ysis of Water and	Wastes",	USEPA-EMSL,
authori	zed by the 1		this hardcopy datager or the Manageure. Lab Manager:		
				1 1	in wing
			Date:	4/19/9/	

COVER PAGE - IN

Project# 14236

Samples 01 through 08 were analyzed on 4/01/91. We realize sample 06 is a duplicate of 05 and that this is a field blank. Sample 06 was slightly over the detection limit so we decided to reanalyze the sample on 4/18/91. The result for the latter date was reported. All raw data are included.

Laboratory Supervisor <u>Jame Lamo</u>

C - Concentration Qualifier:

Enter a "B" if the reported value is less than the Contract Required Detection Limit (CRDL) but greater than the Instrument Detection Limit (IDL). If the analyte was analyzed for but not detected, a "U" must be entered.

Q - Quality Control Qualifiers:

- E The reported value is estimated because of the presence of interference. An explanatory note must be included under Comments on the cover Page (if the problem applies to all samples) or on the specific FORM I-IN (if it is an isolated problem).
- M Duplicate injection precision not met.
- N Spiked sample recovery not within control limits.
- S The reported value was determined by the Method of Standard Additions (MSA).
- W Post-digestion spike for Furnace AA analysis is out of control limits (85-115%), while sample absorbance is less than 50% of spike absorbance.
- * Duplicate analysis not within control limits.
- + Correlation coefficient for the MSA is less than 0.995.

Entering "S", "W", or "+" is mutually exclusive. No combination of these qualifiers can appear in the same field for an analyte.

M - Method Qualifier:

"NR" if the analyte is not required to be analyzed

[&]quot;P" for ICP "A" for Flame AA 11 FII for Furnace AA "CV" for Manual Cold Vapor AA "AV" for Automated Cold Vapor AA "AS" for Semi-Automated Spectrophotometric "C" for Manual Spectrophotometric пТп for Titrimetric

1423608

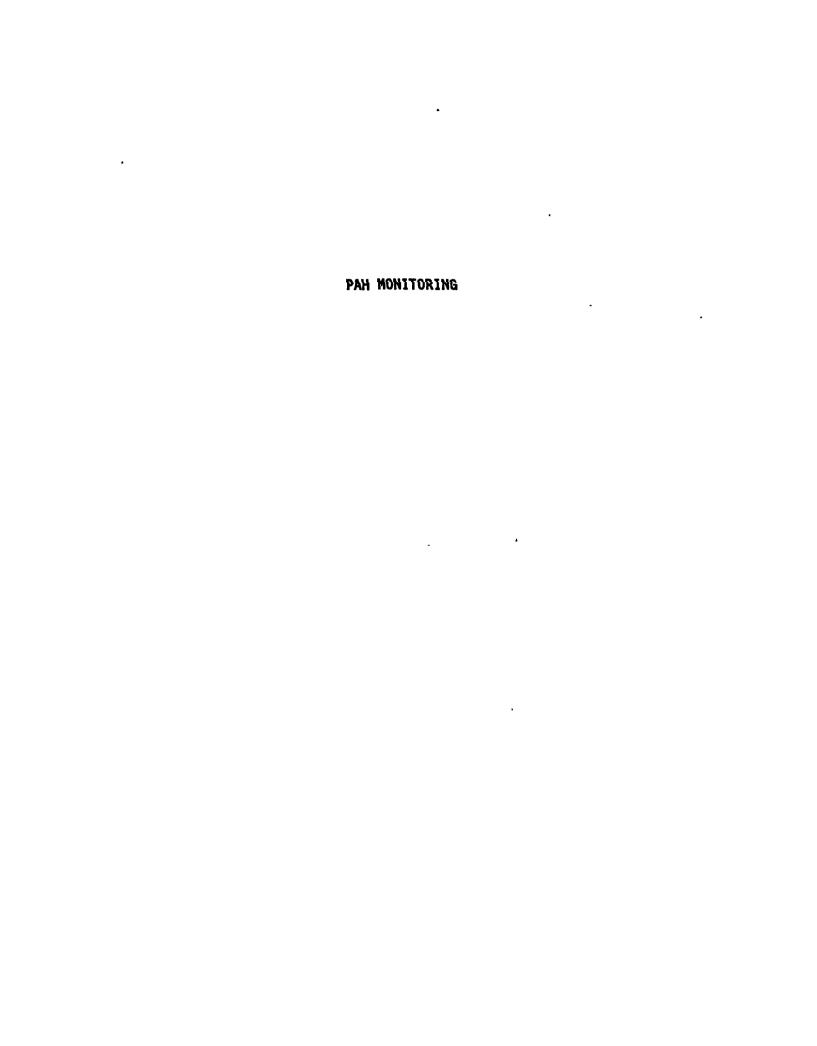
1 INORGANIC ANALYSIS DATA SHEET

0000011

ab Name: ROO	CKY MOUNTAIN AND	ALYTICAL C	Contract		
Lab Code: ENS	SECO Case No	o.: SAS No.	:	SDG No.:	
		Lab Sample			
Bevel (10w/1		Date Recei	.vea: <u>us</u>	<u>/29/91</u>	
	Conc	centration Units: y	ng/L		
	Analyte	Concentration	С	Q	
	PHENOLS	5	ט		
				<u> </u>	
Color Before	: COLORLESS Cla	arity Before: <u>CLEAI</u>	R	Texture:	
		larity After:			
Comments:					

RAP SECTION 6.1.4. MONITORING

2ND QUARTER - 1991





CASE NARRATIVE

FOR

City of St. Louis Park

June 21, 1991

Enseco - RMAL Project Number 014781

Introduction

Nine aqueous samples were received at Enseco Rocky Mountain Analytical Laboratory on May 02, 1991. The samples were logged in under RMAL project number 014781. Sample IGV-W105FBD-050191 (RMA # 014781-08) was extracted and held as per the QAPP. A cross reference associating the RMAL sample numbers to the actual field sample numbers is included. The samples were analyzed for part-per-trillion (ppt) polynuclear aromatic hydrocarbons (PAH).

Data Quality Assessment

The results contained in this report were reviewed relative to data acceptance criteria as specified in the April 1990 QAPP for completeness, precision, accuracy, representativeness and defensibility of the data. Unless otherwise stated below, no quality control problems or technical difficulties were encountered which would impact the interpretation or use of data in this report.

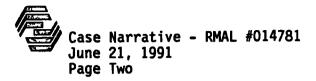
PPT PAH

Samples 014781-01 and 02 were reanalyzed at dilutions due to 2,3-dihydroindene, benzo(B)thiophene and acenapthene which were saturated in the original analysis. Both the original and the reanalyses are submitted for each sample. Surrogates could not be measured in the reanalyses due to the dilutions performed.

Due to concentrations of target compounds present in excess of calibration range, samples 014781-03 and 09 were analyzed and reported at dilutions. Surrogates could not be measured due to the dilutions performed.

All samples and one of the the associated method blanks show target compounds that do not meet secondary ion confirmation. In some instances a compound that does not meet secondary ion confirmation criteria may still be determined to be present in the sample after close inspection of the data by the analyst. Supportive data includes mass chromatograms maxima at the same scan for primary and secondary ions, as well as discernible quantitation interference with the secondary ion. These compounds are flagged with asterisk (*) on the data sheets (Form I) as per the 1990 QAPP.

Enseco Incorporated 4955 Yarrow Street Arvada, Colorado 80002 303/421-6611 Fax. 303/431-7171



This data package is in compliance with the terms and conditions of the 1990 QAPP, both technically and for completeness, for other than the conditions detailed above.

Reported by: Dracy Contox

Date: 06-21-91

Data Control Supervisor

Approved by: Succe Valla for Date: 6-21-4

Program Administrator



SAMPLE DESCRIPTION INFORMATION for City of St. Louis Park

			Sample	Received		
Lab ID	Client ID	Matrix	Date	Time	Date	
014781-0001-SA 014781-0002-SA 014781-0003-SA 014781-0004-SA 014781-0005-SA 014781-0006-SA 014781-0008-SA 014781-0008-SA	W133 W24 W33 IGV-W105-050191 IGV-W105D-050191 PCJ-SLP10-050191 IGV-W105FB-050191 IGV-W105FBD-050191 W412	AQUEOUS AQUEOUS AQUEOUS AQUEOUS AQUEOUS AQUEOUS AQUEOUS AQUEOUS AQUEOUS	01 MAY 91 01 MAY 91 01 MAY 91 01 MAY 91 01 MAY 91 01 MAY 91 01 MAY 91		02 MAY 91 02 MAY 91 02 MAY 91 02 MAY 91 02 MAY 91 02 MAY 91 02 MAY 91	



TABLE OF CONTENTS FOR CITY OF ST. LOUIS PARK RMAL PROJECT# 014781

PPT PAH

QC Summary	.0001
Sample Data	.0013
Standards Data	.0575-A
Raw OC Data	1064



Qualifier Codes and their Usage

- U = Indicates compound was analyzed for but not detected. The sample quantitation limit is corrected for dilution and for percent moisture. For soil samples subjected to GPC clean-up procedures, the CRQL (contract required quantitation limit) is multiplied by two to account for the fact that only half of the extract is recovered.
- J = Indicates an estimated value. This flag is used when the mass spectral data indicates the presence of a compound that meets the identification criteria but the result is less than the sample quantitation limit but greater than zero.
- N = Indicates presumptive evidence of a compound. This flag is only used for tentatively identified compounds, where the identification is based on a mass spectral library search. It is applied to all TIC results.
- B = This flag is used when the analyte is found in the associated blank as well as in the sample. B codes do not necessarily invalidate the data but are dependent upon the judgement of the reviewer in applying the validation guidelines. This flag is used for a TIC as well as for a positively identified target compound list (TCL) compound.
- E = This flag identifies compounds whose concentrations exceed the calibration range of the GC/MS instrument for that specific analysis.
- D = This flag identifies all compounds identified during a re-analysis of a diluted sample.
- A = This flag indicates that a TIC is a suspected aldol-condensation product.



Rocky Mountain Analytical Laboratory 4955 Yarrow Street Arvada, CO 80002 303/421-6611 FAX: 303/431-7171

CHAIN	OF CUSTO	DY				<u></u>	· ·				
ENSECO CLUEN	L (it,	JF 5;	1. Lovis Par	K		PACHED BY	Macs	(n)	E SAFE ^{IM} CONDIT	SEAL NUMBER	
5	LP					[BY SAMPLING COMPAN	IY	CONDITION OF CO	INTENTS
	V512					SEALED FOR	MAC DO	NALI) SAMPLING		INITIAL CONTENT	s TEMP °C
SAMPLING SITE	SLP					SEAL NUMB	ER	SAMPLING Don	STATUS e Continu	uing Until	
TEAM LEADER	MAC DOI	VALI				SEAL INTAC	T UPON RECEIPT	BY LAB No	CONTENTS TE	MPERATURE LPON (RECEIPT BY LAB
DATE	TIME		SAMPLE ID/DESCRIPTION		SAMI	PLE TYPE	# CONTAINERS	ANALYSIS P	ARAMETERS		REMARKS
1/30/9/	1610	W41.	2		WA	1812	6	PAUS	(pot)	ļ	
					<u> </u>						
							<u></u>		-		
			-								
<u></u>											
			 		1						
	 	 			 						
	 	 			 						
		CUSTODY TRANS	SFERS PRIOR TO SHIPPING		<u></u>	T	<u></u>	<u> </u>	HIPPING DETAILS	<u> </u>	
REDING	DISHED BY (SIGH	//	RECEIVED BY (SIGNED)	DATE	TIME	DELIVERED 1	TO SHIPPER BY				
HIW Y) (H)					METHOD OF				AIRBILL NUMBER	
May 1				-		RECEIVED FO		SIGNED			DATE/TIME
				 		ENSECO PRO	N. P.C	- Dua	tillage	700	5/2/91 0x40
			· · · · · · · · · · · · · · · · · · ·	<u> </u>		<u> </u>	1781				



Rocky Mountain Analytical Laboratory 4955 Yarrow Street Arvada, CO 80002 303/421-6611 FAX: 303/431-7171

CHAIN (OF CUSTO	DY												
							<u> </u>			SAMPLE SAF	E'M CONDIT			
ENSECO CLIENT	City of	51.	Lair	Park			PACKER BY	A->A+	il. 15	pc		SEAL NUMBER		-
PROJECT	(10		·				SEAL INTACT	UPON RECEIPT	BY SAMPLIN	G COMPANY		CONDITION OF C	ONTENTS	
SAMPLING COMP	PANY						SEALED FOR	SHIPPING BY				INITIAL CONTENT	'S TEMP	
E	NSR						1 7).	. []	7.					°C
SAMPLING SITE	CLP						SEAL NUMBE			Done	G Continu	ing Until		
TEAM LEADER	n Mail	D.VA.L					SEAL INTACT	UPON RECEIPT	BY LAB 1		CONTENTS TEN	IPERATURE UPON	RECEIPT BY LA	•c
DATE	TIME		SAMPLE ID/	NESCOIPTION!		T CAME		# CONTAINERS		ALYSIS PARAA	AFTERS		REMARKS	
			JAMILE 10/ E	DESCRIPTION		T ,				,	ILI END	 	REMARKS	
<u> </u>	1050	W13	3		0)	1.11	HER	6	f4)	H: 6	1-27)			
1	1330	602	4		OZ				!					
1	1645	133) }		03		√	4		V				
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=	<u></u>											<u> </u>		
		CUSTODY TR	ANSFERS PRIOR TO	SHIPPING		-				SHIPPIN	IG DETAILS			· •
RELINQ	UISHED BY (SIGN	NED)	RECEIVED BY	(SIGNED)	DATE	TIME	DELIVERED T	O SHIPPER BY		-				
7):	17				1		METHOD OF	\wedge	A		 	AIRBILL NUMBER		
Diam	1. h-						RECEIVED FO	even A	Syl	SIGNED			DATE/TIME	
			- <u></u>				R.m	1.A.L	·	Fustin	house	<u> </u>	SIZAI	0830
							ENSECO PRO	1478) _(J	- /1			
									·					



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CHAIN O	F CUST	ODY								SAFE TM COND	·		
ENSECO CLIENT PROJECT	CITY OF ST LOUIS PARK							UPON RECEIPT I	BY SAMPLING COMPAN		SEAL NUMBE	R OF CONTENTS	
SAMPLING COMPA	SAY						SEALED FOR	SHIPPING BY			INITIAL CONT	ENTS TEMP	•C
SAMPLING SITE	SAM						SEAL NUMBE	R	SAMPLING E	□ Conti	inuing Until		
TEAM LEADER	242.						SEAL INTACT	UPON RECEIPT I		CONTENTS	TEMPERATURE LF	ON RECEIPT BY LA	•C
DATE	TIME		SAMPLE ID/DESC	RIPTION		SAMI	PLE TYPE	# CONTAINERS	ANALYSIS PA	ARAMETERS		REMARKS	
5-1-91		IGV	-W105FB-0	50191		VXL A	MBER	4	PPT PA	4	SPE	eial Fill editions	Ing
5-1-91		I6V-	WIOS FBD-O.	50191		IXL A	MBER	4	PPT PA	4	SPIC	IdiTions EIAL FIL LITIONS	INS
=======================================	<u> </u>	CUSTODY 1	RANSFERS PRIOR TO SH	IIPPING		<u> </u>			SH	IIPPING DETAI	 LS		
RELINQU	ISHED BY (SIG	NED)	RECEIVED BY (SIG	NED)	DATE	TIME	DELIVERED T	O SHIPPER BY			AIRBILL NUM	BER	
	· 							P LAB	SIGNED		1	O7632	5
						<u>-</u>	R.M ENSECO PRO	J.A.C.	/ Just	eg Dir	<u> </u>	\$/2/91	0840



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CHAIN C	OF CUSTO	YDC							SAMPLE SA		<u> </u>		
ENSECO CLIENT	TyoF	5T L	OUIS PARK	·		PACKED BY	Z S	RY SAMPLIN		TE COND	SEAL NUMBE	OF CONTENTS	
PROJECT	/							DT SAME CIV					
SAMPLING COMP	SAME					SEALED FOR	SHIPPING BY	-			INITIAL CONT		°C
SAMPLING SITE	SAME		•			SEAL NUMBE	ir .		SAMPLING STATE	☐ Conti	nuing Until		
TEAM LEADER	7129					SEAL INTACT UPON RECEIPT BY LAB				CONTENTS T	EMPERATURE L	PON RECEIPT BY LAB	°C
DATE	TIME		SAMPLE ID/DESCRIPTION		SAM	PLE TYPE	# CONTAINERS	AN	ALYSIS PARA	METERS		REMARKS	
5-1-91		IGU	-W105 -050191		IXL	AMBED	6	p	PT P	AH			
5-1-91		IGV	-W105D -050191		IXLA	MINER	6	pp	T PA	H			
5-1-9/	ļ	pev-	-5LP10-050191		IXL.	AMA BEK	6	PF	T PA	H			
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		ļ			_ <u></u>								
			······································		ļ			<u> </u>					
		<u> </u>			<u> </u>								
					ļ								
	<u> </u>	<u> </u>									<u></u>		
		CUSTODY 1	TRANSFERS PRIOR TO SHIPPING			ori wento	O SHIPPER BY		SHIPPI	NG DETAIL	<u>.s</u>		
RELINQU	JISHED BY (SIC	SNED)	RECEIVED BY (SIGNED)	DATE	TIME	7	25K				·	 	····
						METHOD OF	n E	XP.			2865	1BER 5076325	5
-						RECEIVED FO	1.A.L		austin(hope	Ul.	5/2/9/	0840
						ENSECO PRO	1478	10	, , , , , , , , , , , , , , , , , , ,				
ENS-1133				White	- CUENT	Pink -	LAB						

SUMMARY

DATA

PACKAGE

FOR

shal sing & Level Range 18741 # 14781

14781-04

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

Lab Name: ENSECO-RMAL

Contract No.:

Lab Code: ENSECO Case No.: 14781 SAS No.: SDG No.:

Matrix: (soil/water) WATER Lab Sample ID: 14781-04

Lab File ID: X3055 Sample wt/vol: 4050 (g/ml) ML

Level: (low/med) LOW Date Received: 05/02/91

% Moisture: not dec. dec. Date Extracted: 05/05/91

Extraction: (SepF/Cont/Sonc) CONT Date Analyzed: 06/03/91

GPC Cleanup: (Y/N) N pH: 8.0 Dilution Factor: 0.123

CONCENTRATION UNITS: NG/L

CAS NO.	COMPOUND		Q
271-89-6	2,3-Benzofuran	3.6	J
496-11-7	2,3-Dihydroindene_	350	ł
	1H-Indene	220	
	Naphthalene	140	В
4565-32-6	Benzo(B)Thiophene	110	
	Quinoline	3.8	*
	1H-Indole	1.0	J
91-57-6	2-Methylnaphthalene	29	[B
90-12-0	1-Methylnaphthalene	290	В
92-52-4	Biphenyl	43	
208-96-8	Acenaphthylene	64	
83-32-9	Acenaphthene	150	
	Dibenzofuran	44	
	Fluorene	50	
132-65-0	Dibenzothiophene	3.1	
85-01-8	Phenanthrene	51	В
120-12-7	Anthracene	_ 10	
260-94-6	Acridine	_ 13	
	Carbazole	82	İ
206-44-0	Fluoranthene	31	
129-00-0	Pyrene	23	В
56-55-3	Benzo(A) Anthracene	2.0	J *
218-01-9	Chrysene	1.7	J
205-99-2	Benzo(B) Fluoranthene	2.5	ן ט
207-08-9	Benzo(K)Fluoranthene	2.3	ט
	Benzo(E) Pyrene	1.9	ט [
	Benzo(A) Pyrene	2.3	U
198-55-0	Perylene	⁻ 2.5	ן ט
193-39-5	Indeno(1,2,3-CD)Pyrene	2.1	ן ט
53-70-3	Dibenz (A, H) Anthracene	1.6	ַ ע
	Benzo(G,H,I)Perylene	2.8	Ū

^{# =} Compound is saturated.

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

14781-05

Lab Name: ENSECO-RMAL Contract No.:

Lab Code: ENSECO Case No.: 14781 SAS No.: SDG No.:

Matrix: (soil/water) WATER Lab Sample ID: 14781-05

Sample wt/vol: 4200 (g/ml) ML Lab File ID: X3056

Level: (low/med) LOW Date Received: 05/02/91

% Moisture: not dec. dec. Date Extracted: 05/05/91

Extraction: (SepF/Cont/Sonc) CONT Date Analyzed: 06/03/91

GPC Cleanup: (Y/N) N pH: 8.0 Dilution Factor: 0.119

CONCENTRATION UNITS: NG/L

CAS NO. COMPOUND Q 271-89-6----2,3-Benzofuran 4.7 J 496-11-7----2,3-Dihydroindene 430 95-13-6-----1H-Indene 270 91-20-3----Naphthalene 170 В 4565-32-6-----Benzo(B) Thiophene 130 91-22-5----Quinoline 4.5 120-72-9-----1H-Indole 1.2 J 91-57-6----2-Methylnaphthalene 14 В 90-12-0----1-Methylnaphthalene 350 В 92-52-4----Biphenyl 53 208-96-8-----Acenaphthylene 81 83-32-9----Acenaphthene 200 132-64-9-----Dibenzofuran 59 86-73-7----Fluorene 68 132-65-0-----Dibenzothiophene 5.5 85-01-8----Phenanthrene 85 В 120-12-7-----Anthracene 15 260-94-6-----Acridine 16 86-74-8-----Carbazole 110 206-44-0----Fluoranthene 58 129-00-0----Pyrene 44 В 56-55-3----Benzo(A)Anthracene 2.9 218-01-9-----Chrysene J 2.1 205-99-2----Benzo(B) Fluoranthene U 2.4 207-08-9----Benzo(K)Fluoranthene U 2.2 U 192-97-2----Benzo(E) Pyrene 1.8 50-32-8-----Benzo(A) Pyrene U 2.2 198-55-0----Perylene 2.4 U 193-39-5----Indeno(1,2,3-CD)Pyrene 2.0 U 53-70-3-----Dibenz(A,H)Anthracene 1.5 U 191-24-2----Benzo(G,H,I)Perylene 2.7 U

^{# =} Compound is saturated.

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

14781-07

Lab Name: ENSECO-RMAL Contract No.:

Lab Code: ENSECO Case No.: 14781 SAS No.: SDG No.:

Matrix: (soil/water) WATER Lab Sample ID: 14781-07

Sample wt/vol: 4000 (g/ml) ML Lab File ID: X3037

Level: (low/med) LOW Date Received: 05/02/91

% Moisture: not dec. dec. Date Extracted: 05/05/91

Extraction: (SepF/Cont/Sonc) CONT Date Analyzed: 05/31/91

GPC Cleanup: (Y/N) N pH: 8.0 Dilution Factor: 0.125

CONCENTRATION UNITS: NG/L

CAS NO. COMPOUND Q 271-89-6----2,3-Benzofuran 5.1 U 496-11-7----2,3-Dihydroindene 1.2 J 95-13-6----1H-Indene 0.9 U 91-20-3----Naphthalene 3.5 JB 4565-32-6----Benzo(B) Thiophene 0.9 U 91-22-5----Quinoline 5.1 120-72-9-----1H-Indole U 2.4 91-57-6----2-Methylnaphthalene 4.4 В 90-12-0----1-Methylnaphthalene 2.2 B* 92-52-4----Biphenyl 1.1 J 208-96-8----Acenaphthylene U 1.4 83-32-9----Acenaphthene 1.3 U 132-64-9-----Dibenzofuran 1.0 U 86-73-7----Fluorene U 1.0 132-65-0-----Dibenzothiophene U 1.1 85-01-8----Phenanthrene В 2.7 120-12-7-----Anthracene 1.1 U 260-94-6----Acridine 2.9 U 86-74-8-----Carbazole 1.9 U 206-44-0----Fluoranthene U 1.4 В 129-00-0----Pyrene 1.5 56-55-3----Benzo(A) Anthracene 2.5 Ħ 218-01-9-----Chrysene 2.8 U 205-99-2----Benzo(B) Fluoranthene 2.5 U 207-08-9----Benzo(K) Fluoranthene 2.3 U 192-97-2----Benzo(E) Pyrene 1.9 U U 50-32-8----Benzo(A) Pyrene 2.3 U 198-55-0----Perylene 2.5 193-39-5----Indeno(1,2,3-CD)Pyrene 2.1 U 53-70-3----Dibenz(A,H)Anthracene U 1.6 191-24-2----Benzo(G,H,I)Perylene U 2.8

^{# =} Compound is saturated.

2C
WATER SEMIVOLATILE SURROGATE RECOVERY

Lab Name: RMAL Contract:

Lab Code: ENSECO Case No.: 14781 SAS No.: SDG No.:

Level: (low/med) LOW

	EPA SAMPLE NO.	S1 (NAP) #	S2 (FLU) #	S3 (CHR) #
1	14781-01	85	123	45
2	14781-01DL	D	ם	D
3	14781-02	70	144	60
4	14781-02DL	D	D	D
5	14781-03	D	D	D
6	14781-04	82	93	41
7	14781-05	100	120	41
8	14781-06	90	98	43
9	14781-07	76	88	62
10	14781-09	D	D	D
11	BLK01	88	92	80
12	BLK02	90	104	75

			QC LIMITS
Sl	(NAP)	= D8-NAPHTHALENE	(14-108)
S2	(FLU)	= D10-FLUORENE	(41-162)
S3	(CHR)	= D12-CHRYSENE	(10~118)

- # Column to be used to flag recovery values
- * Values outside of contract required QC limits
- D Surrogates diluted out

4B SEMIVOLATILE METHOD BLANK SUMMARY

Lab Name: RMAL Contract:

BLK01

Lab Code: ENSECO Case No.: 14781 SAS No.: SDG No.:

Lab File ID: X3030 Lab Sample ID: BL050591

Instrument ID: 4500-X Date Extracted: 05/05/91

Matrix: (soil/water) WATER Date Analyzed: 05/31/91

Level: (low/med) LOW Time Analyzed: 0014

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS AND MSD:

	EPA	LAB	LAB	DATE
	SAMPLE NO.	SAMPLE ID	FILE ID	ANALYZED
1 2 3 4 5 6 7 8	14781-01 14781-01DL 14781-02 14781-02 14781-03 14781-04 14781-05 14781-06 14781-07	14781-01 14781-01DL 14781-02 14781-02DL 14781-03 14781-04 14781-05 14781-06	X3031 X3089 X3032 X3076 X3075 X3055 X3056 X3036	05/31/91 06/05/91 05/31/91 06/04/91 06/04/91 06/03/91 06/03/91 05/31/91

Comments:

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

BLK01

Lab Name: ENSECO-RMAL

Contract No.:

Lab Code: ENSECO Case No.: 14781 SAS No.: SDG No.:

Matrix: (soil/water) WATER Lab Sample ID: BLK01

Sample wt/vol: 4000 (g/ml) ML Lab File ID: X3030

Level: (low/med) LOW Date Received:

% Moisture: not dec. dec. Date Extracted: 05/05/91

Extraction: (SepF/Cont/Sonc) CONT Date Analyzed: 05/31/91

Dilution Factor: 0.125 GPC Cleanup: (Y/N) N pH: 7.0

CONCENTRATION UNITS: NG/L

CAS NO.	COMPOUND	MONITO: NG/L	Q
	2,3-Benzofuran	5.1	U
496-11-7	2,3-Dihydroindene	1.4	ľυ
95-13-6	1H-Indene	0.9	U
	Naphthalene	3.3	J
	Benzo(B)Thiophene	0.9	ซ
91-22-5		1.4	U
120-72-9	1H-Indole	2.5	U
91-57-6	2-Methylnaphthalene	3.8	
90-12-0	1-Methylnaphthalene	2.0	*
92-52-4		4.3	U
208-96-8	Acenaphthylene	1.4	U
83-32-9	Acenaphthene	1.3	U
132-64-9	Dibenzofuran	1.0	U
86-73-7	Fluorene	1.0	U
132-65-0	Dibenzothiophene	1.1	υ
85-01-8	Phenanthrene	1.7	
120-12-7	Anthracene	1.1	ט
260-94-6	Acridine	2.9	υ
86-74-8	Carbazole	1.9	υ
206-44-0	Fluoranthene	1.4	υ
129-00-0	Pyrene	1.1	J
	Benzo(A) Anthracene	2.5	U
218-01-9	Chrysene	2.8	υ
	Benzo(B) Fluoranthene	2.5	U
	Benzo(K) Fluoranthene	2.3	Ū
	Benzo(E)Pyrene	1.9	บั
50-32-8	Benzo(A) Pyrene	2.3	Ū
198-55-0	Pervlene	2.5	Ū
193-39-5	Indeno(1,2,3-CD)Pyrene	2.1	Ŭ
	Dibenz (A, H) Anthracene	1.6	Ü
	Benzo(G,H,I)Perylene	2.8	ΰ

4B SEMIVOLATILE METHOD BLANK SUMMARY

BLK02

Lab Name: RMAL Contract:

Lab Code: ENSECO Case No.: 14781 SAS No.: SDG No.:

Lab File ID: X3039 Lab Sample ID: BL050491

Instrument ID: 4500-X Date Extracted: 05/04/91

Matrix: (soil/water) WATER Date Analyzed: 05/31/91

Level: (low/med) LOW Time Analyzed: 0753

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS AND MSD:

	EPA	LAB	LAB	DATE
	SAMPLE NO.	SAMPLE ID	FILE ID	ANALYZED
1	14781-09	14781-09	X3078	05/31/91

Comments:

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

BLK02

EPA SAMPLE NO.

Lab Name: ENSECO-RMAL Contract No.:

Lab Code: ENSECO Case No.: 14781 SAS No.: SDG No.:

Matrix: (soil/water) WATER Lab Sample ID: BLK02

Sample wt/vol: 4000 (g/ml) ML Lab File ID: X3039

Level: (low/med) LOW Date Received:

% Moisture: not dec. dec. Date Extracted: 05/04/91

Extraction: (SepF/Cont/Sonc) CONT Date Analyzed: 05/31/91

GPC Cleanup: (Y/N) N pH: 6.0 Dilution Factor: 0.125

CONCENTRATION UNITS: NG/L

CAS NO.	COMPOUND		Q
	2,3-Benzofuran	5.1	ט
496-11-7	2,3-Dihydroindene	1.4	ע
	1H-Indene	0.9	ט
91-20-3	Naphthalene	1.7	J
	Benzo(B) Thiophene	0.9	บ
	Quinoline	1.4	ן די
	1H-Indole	2.5	ט
	2-Methylnaphthalene	1.8	
	1-Methylnaphthalene	1.6	ט
	Biphenyl	4.3	ָ ע
208-96-8	Acenaphthylene	1.4	U
83-32-9	Acenaphthene	1.3	ט
132-64-9	Dibenzofuran	_ 1.0	ט
86-73-7	Fluorene	1.0	U
132-65-0	Dibenzothiophene	1.1	ן ט
85-01-8	Phenanthrene	2.0	}
120-12-7	Anthracene	_ 1.1	ט
260-94-6	Acridine	2.9	ן ט
86-74-8	Carbazole	_ 1.9	ע
206-44-0	Fluoranthene	_ 1.4	ן ט
129-00-0	Pyrene	_ 1.2	J
56-55-3	Benzo(A) Anthracene	2.5	ן ט
218-01-9	Chrysene	2.8	ן ד
205-99-2	Benzo(B) Fluoranthene	2.5	ซ
207-08-9	Benzo(K)Fluoranthene	2.3	ט
	Benzo(E)Pyrene	1.9	ט
	Benzo(A) Pyrene	_ 2.3	ט
198-55-0	Perylene	_ 2.5	U
	Indeno(1,2,3-CD)Pyrene	2.1	ט
53-70-3	Dibenz (A, H) Anthracene	1.6	บ
191-24-2	Benzo(G,H,I)Perylene	2.8	ט

5B SEMIVOLATILE ORGANIC GC/MS PAH

Lab Name: RMAL Contract No:

Lab Code: ENSECO Case No: 14781 SAS No: SDG No:

THIS PERFORMANCE TUNE APPLIES TO THE FOLLOWING SAMPLES, BLANKS AND STANDARDS

SAMPLE ID	LAB FILE ID	DATE OF ANALYSIS	TIME OF ANALYSIS
40 PPB PAH STD	X3029	05/30/91	2300
BLK01	X3030	05/31/91	0014
BLK02	X3039	05/31/91	0753
14781-01	X3031	05/31/91	0107
14781-02	X3032	05/31/91	0158
14781-06	X3036	05/31/91	0522
14781-07	X3037	05/31/91	0612

SEMIVOLATILE ORGANIC GC/MS PAH

Lab Name: RMAL

Contract No:

Lab Code: ENSECO Case No: 14781 SAS No: SDG No:

THIS PERFORMANCE TUNE APPLIES TO THE FOLLOWING SAMPLES, BLANKS AND STANDARDS

SAMPLE ID	LAB FILE ID	DATE OF ANALYSIS	TIME OF ANALYSIS
40 PPB_PAH_STD	X3054	06/03/91	1515
14781-04	X3055	06/03/91	1648
14781-05	X3056	06/03/91	1739

5B SEMIVOLATILE ORGANIC GC/MS PAH

Lab Name: RMAL Contract No:

Lab Code: ENSECO Case No: 14781 SAS No: SDG No:

THIS PERFORMANCE TUNE APPLIES TO THE FOLLOWING SAMPLES, BLANKS AND STANDARDS

SAMPLE ID	LAB FILE ID	DATE OF ANALYSIS	TIME OF ANALYSIS
40 PPB_PAH_STD	X3074	06/04/91	1624
14781-03	X3075	06/04/91	1747
14781-02DL	X3076	06/04/91	1840
14781-09	X3078	06/04/91	2027

5B SEMIVOLATILE ORGANIC GC/MS PAH

Lab Name: RMAL

Contract No:

Lab Code: ENSECO Case No: 14781 SAS No: SDG No:

THIS PERFORMANCE TUNE APPLIES TO THE FOLLOWING SAMPLES, BLANKS AND STANDARDS

SAMPLE ID	LAB FILE ID	DATE OF ANALYSIS	TIME OF ANALYSIS
40 PPB_PAH_STD	X3088	06/05/91	1534
14781-01DL	X3089	06/05/91	1713

INITIAL CALIBRATION DATA PAH COMPOUNDS

Lab Name: RMAL Lab Code: ENSECO Case No: 14781

Instrument ID: 4500-X Calibration Date(s): 03/25/91

Lab File ID: RRF 20= X2941 RRF 240= X2942 RRF 1200= X2943				RRF RRF 4	40= X29 1800= X29		
COMPOUND	20 PPB RRF	40 PPB RRF	240PPB RRF	1200PPB RRF	4800PPB RRF	AVE RRF	%RSD
2,3-Benzofuran	0.932	0.934	0.887	0.921	0.926	0.920	2.1
2,3-Dihydroindene	0.726	0.781	0.762	0.802	0.805	0.775	4.2
1H-Indene	0.743	0.817	0.739	0.788	0.794	0.776	4.4
Naphthalene	1.722	1.639	1.730	1.794	1.817	1.740	4.0
Benzo(B)Thiophene	1.342	1.230	1.277	1.319	1.330	1.300	3.5
Quinoline	0.592	0.740	0.815	0.961	1.029	0.827	
1H-Indole	0.820	0.788	0.928	1.029	1.074	0.928	
2-Methylnaphthalene	0.673	0.766	0.753	0.783	0.795	0.756	
1-Methylnaphthalene	0.727	0.800	0.814	0.849	0.858	0.810	6.4
Biphenyl	1.060	1.117	1.201	1.263	1.273	1.183	7.8
Acenaphthylene	1.280	1.387	1.493	1.714	1.796	1.534	
Acenaphthene	1.004	0.998	1.052	1.117	1.115	1.057	5.5
Dibenzofuran	1.257	1.271	1.399	1.466	1.488	1.376	7.8
Fluorene	1.039	1.089	1.150	1.223	1.248	1.150	7.7
Dibenzothiophene	0.837	0.810	0.815	0.861	0.802	0.825	2.9
Phenanthrene	0.835	0.880	0.888	0.940	0.885	0.886	4.2
Anthracene	0.669	0.787	0.849	0.949	0.913	0.833	
Acridine	0.320	0.442	0.529	0.692	0.685	0.534	29.9
Carbazole	0.645	0.618	0.703	0.787	0.754	0.701	10.1
Fluoranthene	0.930	1.016	0.984	1.079	1.020	1.006	5.4
Pyrene	1.238	1.180	1.050	1.102	1.044	1.123	7.5
Benzo(A) Anthracene	1.038	1.130	1.248	1.222	1.135	1.155	7.2
Chrysene	1.414	1.388	1.354	1.245	1.132	1.307	8.9
Benzo(B) Fluoranthene	1.029	1.039	1.054	1.060	1.053	1.047	1.2
Benzo (K) Fluoranthene	1.543	1.271	1.598	1.356	1.346	1.423	9.8
Benzo (E) Pyrene	1.088	1.152	1.075	1.033	0.968	1.063	6.4
Benzo(A) Pyrene	0.930	1.027	1.052	1.077	1.016	1.020	5.5
Perylene	0.729	0.740	0.809	0.467	0.830	0.715	20.3
Indeno(1,2,3-CD)Pyrene	1.289	1.158	1.156	1.222	1.154	1.196	5.0
Dibenz (A, H) Anthracene	1.040	1.021	1.056	1.060	1.020	1.039	1.8
Benzo(G,H,I)Perylene	1.068	1.067	1.118	1.084	1.026	1.073	3.1
D8-Naphthalene	1.530	1.508	1.569	1.622	1.661	1.578	4.0
D10-Flourene	0.860	0.863	0.931	1.000	1.024	0.936	8.1
D12-Chrysene	1.410	1.193	1.139	1.029	0.944	1.143	15.6

Lab Name: RMAL Lab Code: ENSECO Case No: 14781

Instrument ID: 4500-X Calibration Date(s): 05/30/91 Time: 2300

Lab ID: 3029 Initial Calibration Date: 03/25/91

COMPOUND	INITIAL AVE RRF	40 PPB RRF	%D
2,3-Benzofuran	0.920	1.144	-24.3
2,3-Dihydroindene	0.775	0.987	-27.4
1H-Indene	0.776	0.956	-23.2
Naphthalene	1.740	2.108	-21.1
Benzo(B)Thiophene	1.300	1.456	-12.0
Quinoline	0.827	0.937	-13.3
1H-Indole	0.928	0.974	-5.0
2-Methylnaphthalene	0.756	0.827	-9.4
1-Methylnaphthalene	0.810	0.911	-12.5
Biphenyl	1.183	1.273	-7.6
Acenaphthylene	1.534	1.574	-2.6
Acenaphthene	1.057	1.052	0.5
Dibenzofuran	1.376	1.418	-3.1
Fluorene	1.150	1.139	1.0
Dibenzothiophene	0.825	0.781	5.3
Phenanthrene	0.886	0.881	0.6
Anthracene	0.833	0.832	0.1
Acridine	0.534	0.491	8.1
Carbazole	0.701	0.732	-4.4
Fluoranthene	1.006	0.928	7.8
Pyrene	1.123	1.025	8.7
Benzo(A)Anthracene	1.155	1.222	5.8
Chrysene	1.307	1.287	1.5
Benzo(B)Fluoranthene	1.047	1.159	-10.7
Benzo(K) Fluoranthene	1.423	1.147	19.4
Benzo(E) Pyrene	1.063	1.069	-0.6
Benzo(A) Pyrene	1.020	1.026	-0.6
Perylene	0.715	0.828	-15.8
Indeno(1,2,3-CD)Pyrene	1.196	1.011	15.5
Dibenz(A,H)Anthracene	1.039	0.881	15.2
Benzo(G,H,I)Perylene	1.073	0.953	11.2
D8-Naphthalene	1.578	1.770	-12.2
D10-Flourene	0.936	0.911	2.7
D12-Chrysene	1.143	1.272	-11.3

Lab Name: RMAL Lab Code: ENSECO Case No: 14781

Instrument ID: 4500-X Calibration Date(s): 06/03/91 Time: 1515

Lab ID: 3054 Initial Calibration Date: 03/25/91

COMPOUND	INITIAL AVE RRF	40 PPB RRF	&D
2,3-Benzofuran	0.920	1.058	-15.0
2,3-Dihydroindene	0.775	0.932	-20.3
1H-Indene	0.776	0.883	-13.8
Naphthalene	1.740	1.929	-10.9
Benzo(B)Thiophene	1.300	1.359	-4.5
Quinoline	0.827	0.895	-8.2
1H-Indole	0.928	0.877	5.5
2-Methylnaphthalene	0.756	0.815	-7.8
1-Methylnaphthalene	0.810	0.886	-9.4
Biphenyl	1.183	1.261	-6.6
Acenaphthylene	1.534	1.580	- 3.0
Acenaphthene	1.057	1.085	-2.6
Dibenzofuran	1.376	1.493	-8.5
Fluorene	1.150	1.228	-6.8
Dibenzothiophene	0.825	0.927	-12.4
Phenanthrene	0.886	0.982	-10.8
Anthracene	0.833	0.891	-7.0
Acridine	0.534	0.530	0.7
Carbazole	0.701	0.786	-12.1
Fluoranthene	1.006	1.059	-5.3
Pyrene	1.123	1.183	-5.3
Benzo(A) Anthracene	1.155	1.231	-6.6
Chrysene	1.307	1.212	7.3
Benzo(B) Fluoranthene	1.047	1.217	-16.2
Benzo(K) Fluoranthene	1.423	1.243	12.6
Benzo(E) Pyrene	1.063	1.059	0.4
Benzo(A) Pyrene	1.020	1.191	-16.8
Perylene	0.715	0.793	-10.9
Indeno(1,2,3-CD) Pyrene	1.196	0.918	23.2
Dibenz (A, H) Anthracene	1.039	0.826	20.5
Benzo(G,H,I)Perylene	1.073	0.901	16.0
D8-Naphthalene	1.578	1.720	-9.0
D10-Flourene	0.936	0.917	2.0
D12-Chrysene	1.143	1.115	2.4

Lab Name: RMAL Lab Code: ENSECO Case No: 14781

Instrument ID: 4500-X Calibration Date(s): 06/04/91 Time: 1624

Lab ID: 3074 Initial Calibration Date: 03/25/91

COMPOUND	INITIAL AVE RRF	40 PPB RRF	₹D
2,3-Benzofuran	0.920	1.052	-14.3
2,3-Dihydroindene	0.775	0.922	-19.0
1H-Indene	0.776	0.874	-12.6
Naphthalene	1.740	1.886	-8.4
Benzo(B)Thiophene	1.300	1.332	-2.5
Quinoline	0.827	0.793	4.1
1H-Indole	0.928	0.659	29.0
2-Methylnaphthalene	0.756	0.837	-10.7
1-Methylnaphthalene	0.810	0.926	-14.3
Biphenyl	1.183	1.194	-0.9
Acenaphthylene	1.534	1.600	-4.3
Acenaphthene	1.057	1.042	1.4
Dibenzofuran	1.376	1.373	0.2
Fluorene	1.150	1.150	0.0
Dibenzothiophene	0.825	0.804	2.5
Phenanthrene	0.886	0.875	1.2
Anthracene	0.833	0.810	2.8
Acridine	0.534	0.474	11.2
Carbazole	0.701	0.662	5.6
Fluoranthene	1.006	1.044	-3.8
Pyrene	1.123	1.254	-11.7
Benzo(A) Anthracene	1.155	1.106	4.2
Chrysene	1.307	1.071	18.1
Benzo(B) Fluoranthene	1.047	1.177	-12.4
Benzo(K) Fluoranthene	1.423	1.084	23.8
Benzo(E)Pyrene	1.063	0.932	12.3
Benzo(A) Pyrene	1.020	0.940	7.8
Perylene	0.715	0.736	-2.9
Indeno(1,2,3-CD)Pyrene	1.196	0.940	21.4
Dibenz (A, H) Anthracene	1.039	0.864	16.8
Benzo(G,H,I)Perylene	1.073	0.897	16.4
D8-Naphthalene	1.578	1.768	-12.0
D10-Flourene	0.936	0.942	-0.6
D12-Chrysene	1.143	1.026	10.2

Lab Name: RMAL Lab Code: ENSECO Case No: 14781

Instrument ID: 4500-X Calibration Date(s): 06/05/91 Time: 1534

Lab ID: 3088 Initial Calibration Date: 03/25/91

COMPOUND	INITIAL AVE RRF	40 PPB RRF	%D
2,3-Benzofuran	0.920	1.015	-10.3
2,3-Dihydroindene	0.775	0.912	-17.7
1H-Indene	0.776	0.862]-11.1
Naphthalene	1.740	1.845	-6.0
Benzo(B)Thiophene	1.300	1.237	4.8
Quinoline	0.827	0.709	14.3
1H-Indole	0.928	0.696	25.0
2-Methylnaphthalene	0.756	0.750	0.8
1-Methylnaphthalene	0.810	0.842	-4.0
Biphenyl	1.183	1.090	7.9
Acenaphthylene	1.534	1.736	-13.2
Acenaphthene	1.057	1.087	-2.8
Dibenzofuran	1.376	1.372	0.3
Fluorene	1.150	1.159	-0.8
Dibenzothiophene	0.825	0.808	2.1
Phenanthrene	0.886	0.884	0.2
Anthracene	0.833	0.825	1.0
Acridine	0.534	0.468	12.4
Carbazole	0.701	0.635	9.4
Fluoranthene	1.006	1.089	-8.3
Pyrene	1.123	1.265	-12.6
Benzo(A)Anthracene	1.155	1.057	8.5
Chrysene	1.307	1.142	12.6
Benzo(B) Fluoranthene	1.047	1.044	0.3
Benzo(K) Fluoranthene	1.423	1.116	21.6
Benzo (E) Pyrene	1.063	0.999	6.0
Benzo(A) Pyrene	1.020	0.964	5.5
Perylene	0.715	0.752	-5.2
Indeno(1,2,3-CD)Pyrene	1.196	0.867	27.5
Dibenz (A, H) Anthracene	1.039	0.773	25.6
Benzo(G,H,I)Perylene	1.073	0.832	22.5
D8-Naphthalene	1.578	1.660	-5.2
D10-Flourene	0.936	0.906	3.2
D12-Chrysene	1.143	1.073	6.1

Lab Name: RMAL Contract:

Lab Code: ENSECO Case No: 14781 SAS No.: SDG No:

Lab File ID (Standard): X3029 Date Analyzed: 05/30/91

Instrument ID: 4500-X Time Analyzed: 2300

	IS#1 (ACN) AREA #	IS#2 (PHN) AREA #	IS#3 (BAP) AREA #
12 HOUR STD	365000	606000	37200
UPPER LIMIT	730000	1212000	74400
LOWER LIMIT	183000	303000	18600
SAMPLE NO.			
BLK01 BLK02 14781-01 14781-02 14781-06 14781-07	406000 342000 527000 567000 391000 428000	644000 540000 886000 790000 576000 635000	443000 356000 626000 553000 458000 435000

IS#3 (BAP) = D12-BENZO(A) PYRENE LOWER LIMIT = - 50%

of internal standard area

Lab Name: RMAL Contract:

Lab Code: ENSECO Case No: 14781 SAS No.: SDG No:

Date Analyzed: 06/03/91 Lab File ID (Standard): X3054

Instrument ID: 4500-X Time Analyzed: 1515

	IS#1 (ACN) AREA #	IS#2 (PHN) AREA #	IS#3 (BAP) AREA #
12 HOUR STD	115000	198000	155000
UPPER LIMIT	230000	396000	310000
LOWER LIMIT	58000	99000	76000
SAMPLE NO.			
14781-04 14781-05	126000 126000	206000 194000	158000 157000

IS#1 (ACN) = D10-ACENAPHTHENE UPPER LIMIT = + 100% of internal standard area IS#3 (BAP) = D12-BENZO(A)PYRENE LOWER LIMIT = - 50%

of internal standard area

Lab Name: RMAL Contract:

Lab Code: ENSECO Case No: 14781 SAS No.: SDG No:

Lab File ID (Standard): X3074 Date Analyzed: 06/04/91

Instrument ID: 4500-X Time Analyzed: 1624

	IS#1 (ACN) AREA #	IS#2 (PHN) AREA #	IS#3 (BAP) AREA #
12 HOUR STD	67800	117000	92200
UPPER LIMIT	136000	234000	184000
LOWER LIMIT	34000	585000	46000
SAMPLE NO.			
14781-02DL 14781-03 14781-09	116000 962000 118000	204000 217000 208000	147000 116000 147000

of internal standard area

Lab Name: RMAL Contract:

Lab Code: ENSECO Case No: 14781 SAS No.: SDG No:

Date Analyzed: 06/05/91 Lab File ID (Standard): X3088

Instrument ID: 4500-X Time Analyzed: 1534

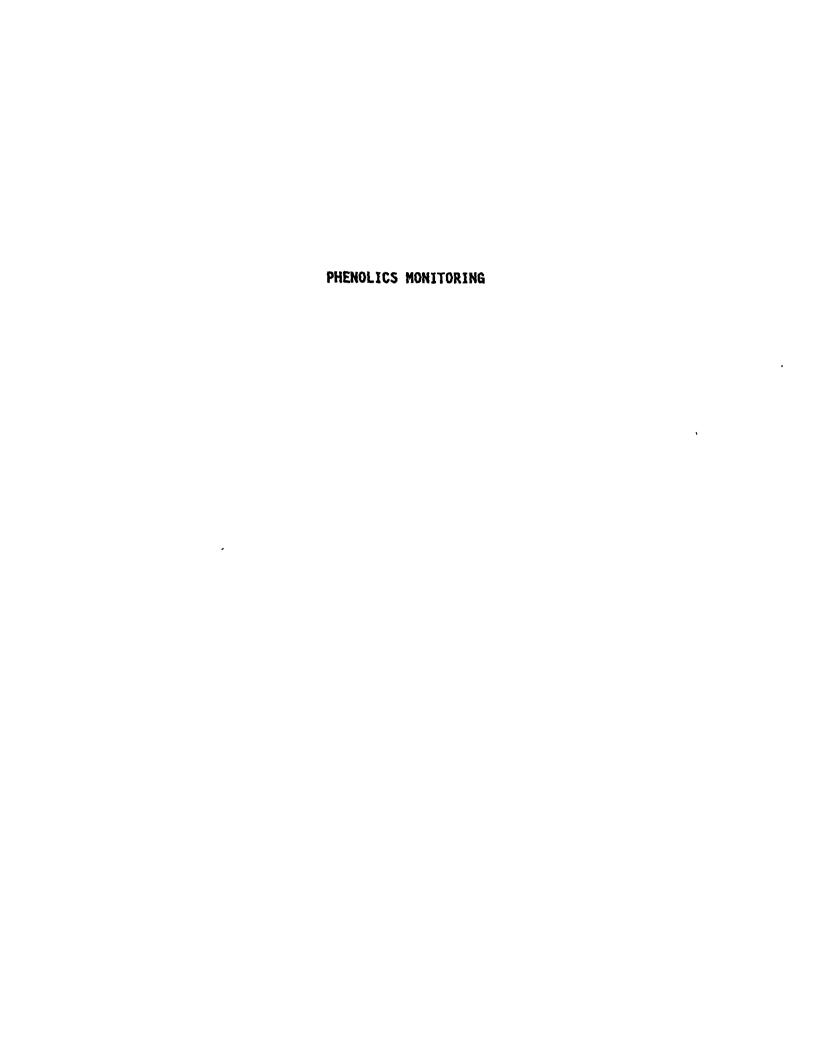
	IS#1 (ACN) AREA #	IS#2 (PHN) AREA #	IS#3 (BAP) AREA #
12 HOUR STD	67400	121000	97800
UPPER LIMIT	134000	242000	196000
LOWER LIMIT	34000	60000	49000
SAMPLE NO.			
14781-01DL	103000	240000	108000

UPPER LIMIT = + 100% IS#1 (ACN) = D10-ACENAPHTHENE IS#2 (PHN) = D10-PHENANTHRENE

of internal standard area

IS#3 (BAP) = D12-BENZO(A) PYRENE LOWER LIMIT = - 50%

of internal standard area





July 18, 1991

Mr. James Grube City of St. Louis Park 5005 Minnetonka Blvd. St. Louis Park, MN 55416

Dear Mr. Grube:

Enclosed is the report for ten aqueous samples (includes QC) received at Rocky Mountain Analytical Laboratory on June 28, 1991.

If you have any questions, the Program Administrator assigned to this project is Joel Holtz.

Sincerely,

Joel Holtz

Program Administrator

JH/cm

Enclosures

RMAL# 15612

Project No. Lab Name: ROCKY MOUNTAIN ANALYTICAL

Sample Numbers

RMA SAMPLE NO	CLIENT SAMPLE ID
<u> 1561201 </u>	DPV-W420TP-062791
1561202	DPV-W421TP-062791
1561202D	DPV-W421TPMSD-062791
1561202S	DPV-W421TPMS-062791
1561203	DPV-W421TPD-062791
1561204	DPV-W421TPFB-062791
1561205	DPV-W421TPFBD-062791
1561206	PCV-W23TP-062791
1561207	IGV-W10STP-062791
1561208	STP-W410TP-062791

<u>PARAMETERS</u>	METHOD NO.	DETECTION LIMIT	SOURCE
Phenol	420.1	5 ug/l	1

Comments:

	EIGHT WATER SAMPLES FOR PPB PHENOLICS ANALYSIS.
1	RMA QC# 15612.
1	

1="Methods for Chemical Analysis of Water and Wastes", USEPA-EMSL, Cincinnati.

Release of the data contained in this hardcopy data package has been authorized by the Laboratory Manager or the Manager's designee, as verified by the following signature.

Lab Manager: (2000 8 6000 Date: 7/18/9/

Project # 15612

The samples for this project were prepped for phenol on 7/05/91. On that date 100 mls of sample were prepped. For a reporting limit of 0.05 ppb we distill 200 mls of sample. Since the samples had limited volume 100 more mls were distilled on 7/12/91 and added to the distillate from the first date for a final volume of 200 mls.

Laboratory Supervisor Laboratory Supervisor

RESULT QUALIFIERS

C - Concentration Qualifier:

Enter a "B" if the reported value is less than the Contract Required Detection Limit (CRDL) but greater than the Instrument Detection Limit (IDL). If the analyte was analyzed for but not detected, a "U" must be entered.

Q - Quality Control Qualifiers:

- E The reported value is estimated because of the presence of interference. An explanatory note must be included under Comments on the cover Page (if the problem applies to all samples) or on the specific FORM I-IN (if it is an isolated problem).
- M Duplicate injection precision not met.
- N Spiked sample recovery not within control limits.
- S The reported value was determined by the Method of Standard Additions (MSA).
- W Post-digestion spike for Furnace AA analysis is out of control limits (85-115%), while sample absorbance is less than 50% of spike absorbance.
- * Duplicate analysis not within control limits.
- + Correlation coefficient for the MSA is less than 0.995.

Entering "S", "W", or "+" is mutually exclusive. No combination of these qualifiers can appear in the same field for an analyte.

M - Method Qualifier:

"P"	for ICP
"A"	for Flame AA
"f"	for Furnace AA
"CV"	for Manual Cold Vapor AA
"AV"	for Automated Cold Vapor AA
"AS"	for Semi-Automated Spectrophotometric
"C"	for Manual Spectrophotometric
"T"	for Titrimetric
"NR"	if the analyte is not required to be analyzed

000010

RMA SAMPLE NO 1561207

CLIENT ID NO IGV-W10STP-062791

INORGANIC ANALYSIS DATA SHEET

Lab Name: ROCKY MOUNTAIN ANALYTICAL

COMMENTS:

Matrix (soil/ Level (low/m	'water): <u>WATE</u> ned): <u>LOW</u>	<u>R</u>	Proj Date Re		t No:	06/28/91
% Solids:	0.0					-
	Analyte	Concentration	on	С	Q	Concentration Units
	Phenol	5		ט		ug/L
	-					
					,	
٠.						
Color Before:	COLORLESS	Clarity Before:	CLEA	₹	_ Te	exture:
Color After:		Clarity After:			_ Aı	ctifacts:

RAP SECTION 6.1.4. MONITORING

3RD QUARTER - 1991





CASE NARRATIVE

FOR

City of St. Louis Park

October 26, 1991

Enseco - RMAL Project Number 016727

<u>Introduction</u>

Twelve aqueous samples were received at Enseco Rocky Mountain Analytical Laboratory on August 29, 1991. The samples were logged in under RMAL project number 016727. Sample STP-SLP3FBD-082891 (RMA # 016727-10) was extracted and held as per the QAPP. A cross reference associating the RMAL sample numbers to the actual field sample numbers is included. The samples were analyzed for part-per-trillion (ppt) polynuclear aromatic hydrocarbons (PAH).

Data Quality Assessment

The results contained in this report were reviewed relative to data acceptance criteria as specified in the April 1990 QAPP for completeness, precision, accuracy, representativeness and defensibility of the data. Unless otherwise stated below, no quality control problems or technical difficulties were encountered which would impact the interpretation or use of data in this report.

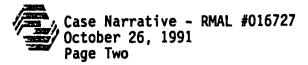
PPT PAH

Samples 16727-03 and 04 were originally analyzed within the holding time at a dilution due to elevated target compounds. Several target compounds were saturated in this original analysis, therefore the samples were reanalyzed outside of the holding time at an additional dilution. Data for both sets of analyses are reported.

Samples 16727-11 and 12 were originally analyzed within the holding time at a dilution due to target compounds present in excess of calibration range. In the original analysis, results for sample 16727-12 showed 2,3-dihydroindene above linear range. Sample was further diluted and analyzed outside of the analysis holding time. Both sets of data are reported.

Surrogates could not be measured in samples 16727-03, 03DL, 04, 04DL, 11, 12 and 12DL due to the dilutions performed.

Enseco Incorporated 4955 Yarrow Street Arvada, Colorado 80002 303/421-6611 Fax: 303/431-7171



Samples 16727-01, 02, 06 and 09 show surrogates which have exceeded the upper control limits. All instrument calibration, surrogate standard concentration, etc. were checked and found to be in control. It has been concluded that an interference specific to the surrogate is present which resulted in the high recovery. This interference does not affect the quantitation of target compounds.

Samples 16727-09 and the associated method blank showed low or no recoveries on the D12-benzo(a)pyrene internal standard. Since this internal standard responded very poorly in the blank and not at all in sample -09 an alternate internal standard (D10-phenanthrene) was used to calculate the compounds normally associated with D12-benzo(a)pyrene.

Surrogate recoveries for D8-napthalene and D12-chrysene have exceeded control limits in the method blank extracted 08-31 (BLKO1) and in the method blank extracted 09-01 (D8-napthalene only) indicating a slight over concentration of the sample or a spike addition error during the extraction process. Target compound data for both method blanks were evaluated and found to be within control, therefore data is accepted.

The 4800 ng/ml and the 2400 ng/ml standards had excessive saturation, therefore they were not used as the upper range for the 5-point calibration curve. Instead, the 1200 ng/ml was used as a high point calibration, while a 600 ng/ml was used for the mid-point calibration.

All samples with the exception of 16727-12DL show target compounds that do not meet secondary ion confirmation. In some instances a compound that does not meet secondary ion confirmation criteria may still be determined to be present in the sample after close inspection of the data by the analyst. Supportive data includes mass chromatograms maxima at the same scan for primary and secondary ions, as well as discernible quantitation interference with the secondary ion. These compounds are flagged with asterisk (*) on the data sheets (Form I) as per the 1990 QAPP.

This data package is in compliance with the terms and conditions of the 1990 QAPP, both technically and for completeness, for other than the conditions detailed above.

> Reported by: " Lacy (oncy Date: 10/26/91
>
> Date: 10/26/91 Tracy Coprov Data Control Supervisor

Approved by: 1 Debbie Fazio

Program Administrator



SAMPLE DESCRIPTION INFORMATION for City of St. Louis Park

			Sampl		Received
Lab ID	Client ID	Matrix	Date	Time	Date
016727-0001-SA 016727-0002-SA 016727-0003-SA 016727-0004-SA 016727-0005-SA 016727-0006-SA 016727-0007-SA 016727-0008-SA 016727-0009-SA 016727-0010-SA 016727-0011-SA 016727-0012-SA	STP-SLP3-082891 STP-SLP3D-082891 PCJW402082891 PCJW406082891 PCJE2082891 PCJE3082891 PCJE13082891 PCJE13082891 STP-SLP3FB-082891 STP-SLP3FBD-082891 IGV-W105-082891 STP-W410-082891	AQUEOUS	28 AUG 91 28 AUG 91	13:55 13:25 13:00 08:15 08:30 08:55	29 AUG 91 29 AUG 91 29 AUG 91 29 AUG 91



Qualifier Codes and their Usage

- U = Indicates compound was analyzed for but not detected. The sample quantitation limit is corrected for dilution and for percent moisture. For soil samples subjected to GPC clean-up procedures, the CRQL (contract required quantitation limit) is multiplied by two to account for the fact that only half of the extract is recovered.
- J = Indicates an estimated value. This flag is used when the mass spectral data indicates the presence of a compound that meets the identification criteria but the result is less than the sample quantitation limit but greater than zero.
- N = Indicates presumptive evidence of a compound. This flag is only used for tentatively identified compounds, where the identification is based on a mass spectral library search. It is applied to all TIC results.
- P = This flag is used for a pesticide/Aroclor target analyte when there is greater than 25% difference for detected concentrations between the two GC columns. The lower of the two values is reported.
- B = This flag is used when the analyte is found in the associated blank as well as in the sample. B codes do not necessarily invalidate the data but are dependent upon the judgement of the reviewer in applying the validation guidelines. This flag is used for a TIC as well as for a positively identified target compound list (TCL) compound.
- E = This flag identifies compounds whose concentrations exceed the calibration range of the GC/MS instrument for that specific analysis.
- D = This flag identifies all compounds identified during a re-analysis of a diluted sample.
- A = This flag indicates that a TIC is a suspected aldol-condensation product.

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

16727-11

Lab Name: ENSECO Contract No.:

Lab Code: ENSECO Case No.: 16727 SAS No.: SDG No.:

Matrix: (soil/water) WATER Lab Sample ID: 16727-11

Sample wt/vol: 4200 (g/ml) ML Lab File ID: C4797

Level: (low/med) LOW Date Received: 08/29/91

% Moisture: not dec. dec. Date Extracted: 09/01/91

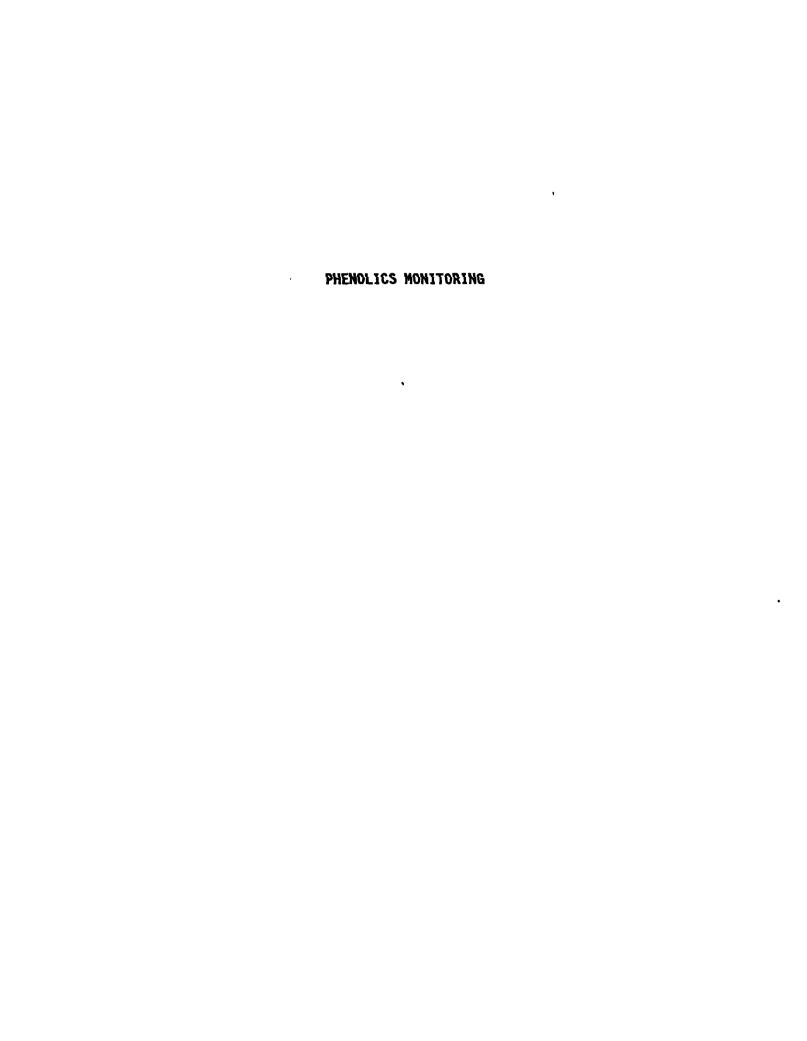
Extraction: (SepF/Cont/Sonc) CONT Date Analyzed: 10/11/91

GPC Cleanup: (Y/N) N pH: 7.0 Dilution Factor: 1.19

CONCENTRATION UNITS: NG/L

CAS NO. COMPOUND

COMPOUND	<u></u>	Q
2,3-Benzofuran	48	ט
	300	В
1H-Indene	8.6	ן ט
Naphthalene	100	В
Benzo(B)Thiophene	68	ļ
Quinoline	13	ט
1 T T 3 . 3 .	l 6.	U
2-Methylnaphthalene_	8.6	U
1-Methylnaphthalene	210	1
Biphenyl	34	J
Acenaphthylene	13	ן ט
Acenaphthene	110	
Dibenzofuran	1 40	
Fluorene	48	
Dibenzothiophene		ן ט
Phenanthrene	43	В
Anthracene	10	ן ט
Acridine	27	ן די
Carbazole	21	*
Fluoranthene	24	
Pvrene	1 16	
Benzo(A) Anthracene	24	ט
Chrysene	27	U
Benzo(B)Fluoranthene	24	ן ט
Benzo(K)Fluoranthene	22	ן ט
Benzo(E)Pyrene	18	U
Benzo(A)Pyrene	22	ט ו
Dervlene	1 24	ן ט
Indeno(1,2,3-CD)Pyrene	20	ע
Dibenz(A,H)Anthracene		U
Benzo(G,H,I)Perylene	27	σ
	2,3-Benzofuran2,3-Dihydroindene1H-IndeneNaphthaleneBenzo(B)ThiopheneQuinoline1H-Indole2-MethylnaphthaleneBiphenylAcenaphthyleneAcenaphthylenePluoreneDibenzofuranFluoreneDibenzothiophenePhenanthreneAcridineCarbazoleFluorantheneBenzo(A)AnthraceneBenzo(B)FluorantheneBenzo(B)Fluoranthene	2,3-Benzofuran 3001H-Indene 8.6Naphthalene 100Benzo(B)Thiophene 68Quinoline 131H-Indole 242-Methylnaphthalene 8.61-Methylnaphthalene 210Biphenyl 34Acenaphthylene 13Acenaphthene 110





RECEIVED

CONTORPORTALIZATION

October 16, 1991

Mr. James Grube City of St. Louis Park 5005 Minnetonka Blvd. St. Louis Park, MN 55416

Dear Mr. Grube:

Enclosed is the report for eleven aqueous samples (includes QC) received at Enseco-Rocky Mountain Analytical Laboratory on September 19, 1991.

If you have any questions, please do not hesitate to call.

Sincerely,

Joel Holtz

Program Administrator

JH/cm

Enclosures

RMAL #17193

U.S.EPA - CLP

COVER PAGE - INORGANIC ANALYSES DATA PACKAGE C000001.

Lab Name:	ROCKY MOUN	TAIN ANALYTICA	AL_	Contra	ct:	
Lab Code:	ENSECO	Case No.:	sz	As No.:	S	DG No.:
SOW No:	7/88					
	1719307 1719308 1719309	ISD IS			-091891 P-091891 P-091891 P-091891 P-091891 P-091891 PMSD-0918 PMS-09189 PD-09189	891 91 1 91 891
<u>Paramete</u>	rs <u>Me</u>	thod No.	<u>Dete</u>	ction Limi	<u>ts</u>	Source
PHENOLIC	S 42	0.1	5	ug/L		1
Comments NINE WA RMA OC#	TER SAMPLES	FOR PPB PHEN	olics :	ANALYSIS.		
	ethods for	Chemical Analy	ysis o	f Water an	d Wastew	ater,"
authoriz	ed by the I	contained in aboratory Mana lowing signat	ager of			
			ьąр	manayer:		a wing
				Date:	10/16	191

COVER PAGE - IN

RESULT QUALIFIERS

C - Concentration Qualifier:

Enter a "B" if the reported value is less than the Contract Required Detection Limit (CRDL) but greater than the Instrument Detection Limit (IDL). If the analyte was analyzed for but not detected, a "U" must be entered.

Q - Quality Control Qualifiers:

- E The reported value is estimated because of the presence of interference. An explanatory note must be included under Comments on the cover Page (if the problem applies to all samples) or on the specific FORM I-IN (if it is an isolated problem).
- . M Duplicate injection precision not met.
 - N Spiked sample recovery not within control limits.
 - S The reported value was determined by the Method of Standard Additions (MSA).
 - W Post-digestion spike for Furnace AA analysis is out of control limits (85-115%), while sample absorbance is less than 50% of spike absorbance.
 - * Duplicate analysis not within control limits.
 - + Correlation coefficient for the MSA is less than 0.995.

Entering "S", "W", or "+" is mutually exclusive. No combination of these qualifiers can appear in the same field for an analyte.

M - Method Qualifier:

- "P" for ICP
- "A" for Flame AA
- "F" for Furnace AA
- "CV" for Manual Cold Vapor AA
- "AV" for Automated Cold Vapor AA
- "AS" for Semi-Automated Spectrophotometric
- "C" for Manual Spectrophotometric
- "T" for Titrimetric
- "NR" if the analyte is not required to be analyzed

EPA SAMPLE NO.

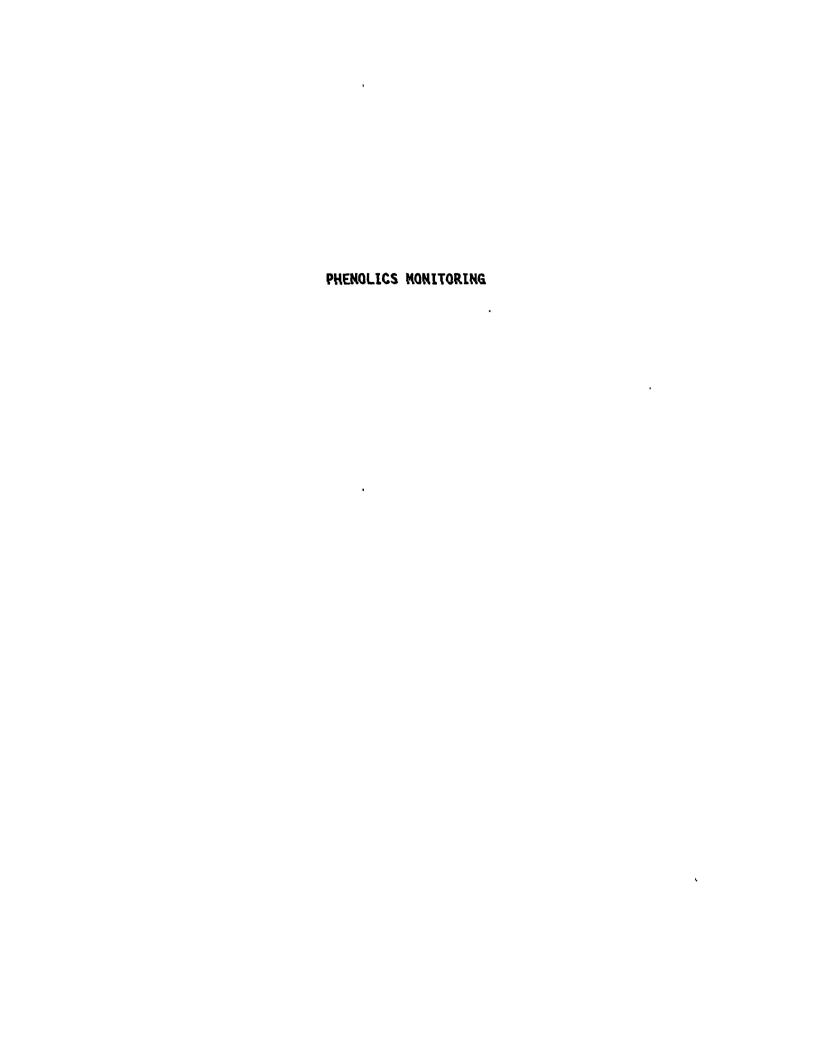
1719302 CUCU: 04

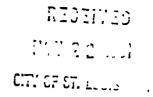
INORGANIC ANALYSIS DATA SHEET

Lab Name: ROC	KY MOUNTAIN ANA	LYTICAL Co	ontract	:	ı
Lab Code: ENS	SECO Case No	o.: SAS No.:		SDG No.:	
	<pre>'water): WATER ned): LOW</pre>				<u>1891</u>
	Conc	entration Units: <u>uc</u>	I/L		
1	Analyte	Concentration	С	Q	
	PHENOLICS	5	ט		
			+		
		arity Before: <u>CLEAR</u>			
Color After:	: C1	larity After:		Artifacts:	
Comments:					
				· · · · · · · · · · · · · · · · · · ·	

RAP SECTION 6.1.4. MONITORING

4TH QUARTER - 1991







November 18, 1991

Mr. James Grube City of St. Louis Park 5005 Minnetonka Blvd. St. Louis Park, MN 55416

Dear Mr. Grube:

Enclosed is the report for eleven aqueous samples (includes QC) received at Enseco-Rocky Mountain Analytical Laboratory on October 17, 1991.

If you have any questions, please do not hesitate to call.

Sincerely,

Debbie Fazio

Program Administrator

DF/cm Enclosures

RMAL #17984

COVER PAGE - INORGANIC ANALYSES DATA PACKAGE

ab	Name:	ROCKY MOUN	rain a	NALYTICAL	_	Contract: _	
Lab	Code:	ENSECO	Case	No.:	_ SAS	No.:	SDG No.:
SOW	No.:	7/88					
		EPA Sample	No			Lab Samp	le TD
		1798401				PCJ-W23TP-1	
		1798402		-	•	DPV-W420TP-	
		1798403		•	•	DPV-W421TP-	
		1798404	•	_		IGV-W105TP-	
		1798405		•		STP-W410TP-	101691
		1798406		-		DPV-W422TP-	101691
		1798406M		-		DPV-W422TPM	S-101691
		<u>1798406M</u>		•		DPV-W422TPM	
		<u> 1798407</u>		-		DPV-W422TPD	
		1798408		-		DPV-W422TPF	
		1798409		-		DPV-W422TPF	BD-101691
				-		 	
				-			
		-		-	•	•	
Pa [,]	ramete:	re M	<u>ethod</u>	No.	Detec	tion Limits	Source
- 4.	<u>Lume ce.</u>	<u> </u>	<u>e ciioa</u>	NO.	Deceo	<u> </u>	<u>504160</u>
Pho	enolic	5	420.1	L	5	ug/L	1
NI	ments: NE WAT A OC#		FOR PE	PB PHENOLIC	S ANA	LYSIS.	
	-						
Sou		thods for t ncinnati.	he Che	emical Anal	ysis	of Water and	Wastes", USEPA-EMSI
aut	horize	f the data d by the La by the foll	borato	ory Manager	or t	dcopy data p he Manager's	ackage has been designee, as
				Lab	Manag	er:	ne Lano/
					J	1	alai 1
				•	Da	te:	8/9/

COVER PAGE - IN

COOCC1-A

RESULT QUALIFIERS

C - Concentration Qualifier:

Enter a "B" if the reported value is less than the Contract Required Detection Limit (CRDL) but greater than the Instrument Detection Limit (IDL). If the analyte was analyzed for but not detected, a "U" must be entered.

Q - Quality Control Qualifiers:

- E The reported value is estimated because of the presence of interference. An explanatory note must be included under Comments on the cover Page (if the problem applies to all samples) or on the specific FORM I-IN (if it is an isolated problem).
- M Duplicate injection precision not met.
- N Spiked sample recovery not within control limits.
- S The reported value was determined by the Method of Standard Additions (MSA).
- W Post-digestion spike for Furnace AA analysis is out of control limits (85-115%), while sample absorbance is less than 50% of spike absorbance.
- * Duplicate analysis not within control limits.
- + Correlation coefficient for the MSA is less than 0.995.

Entering "S", "W", or "+" is mutually exclusive. No combination of these qualifiers can appear in the same field for an analyte.

M - Method Qualifier:

[&]quot;P" for ICP

[&]quot;A" for Flame AA

[&]quot;f" for Furnace AA

[&]quot;CV" for Manual Cold Vapor AA

[&]quot;AV" for Automated Cold Vapor AA

[&]quot;AS" for Semi-Automated Spectrophotometric

[&]quot;C" for Manual Spectrophotometric

[&]quot;T" for Titrimetric

[&]quot;NR" if the analyte is not required to be analyzed

000005 1798404

INORGANIC ANALYSIS DATA SHEET

Lab Name: ROC	KY MOUNTAIN AN	ALYTICAL CO	ontract	:	
Lab Code: ENS	SECO Case No	o.: SAS No.	<u> </u>	SDG No).:
		Lab Sam Date Rec			
	0.0				
	Cone	centration Units: <u>u</u>	g/L		
	Analyte	Concentration	С	Q	
	Phenolics	5	ū		
	`	-	-		
		<u> </u>			
Color Before	COLORLESS Cla	arity Before: <u>CLEA</u>	R	_ Textur	e:
Color After	: C:	larity After:		Artifact	:s:
	,				
Comments:				•	

•	
•	

PRAIRIE DU CHIEN-JORDAN AQUIFER PAH QUALITY CONTROL SUMMARY

Well <u>No.</u>	Sample <u>Date</u>	Method Blank	Field Duplicate	<u>Matrix Spike</u>	<u>Matrix Spike Dup</u>	<u>Field Blank</u>
SLP4	NOT SAMPLED)				
SLP4	NOT SAMPLED)				
SLP4	NOT SAMPLED)				
SLP4	NOT SAMPLED) (
W23	03/28/91	14232-BLK01	DPV-W422D-032891	DPV-W422MS-032891	DPV-W422MSD-032891	DPV-W422FB-032891
W23	06/27/91	15605-BLK01	DPV-W421D-062791	DPV-W421MS-062791	DPV-W421MSD-062791	DPV-W421FB-062791
W23	09/18/91	17191-BLK01	DPV-W420D-091891	DPV-W420MS-091891	DPV-W420MSD-091891	DPV-W420FB-091891
W23	10/16/91	17977-BLK01	DPV-W422D-101691	DPV-W422MS-101691	DPV-W422MSD-101691	DPV-W422FB-101691
W48	NOT SAMPLED)				`
SLP6	03/27/91	14223-BLK01	PCJ-SLP6D-032791	PCJ-SLP6MS-032791	PCJ-SLP6MSD-032791	PCJ-SLP6FB-032791
SLP7	03/27/91	14223-BLK01	PCJ-SLP6D-032791	PCJ-SLP6MS-032791	PCJ-SLP6MSD-032791	PCJ-SLP6FB-032791
W48	NOT SAMPLED)				
SLP6	06/25/91	15570-BLK01	PCJ-SLP6D-062591	PCJ-SLP6MS-062591	PCJ-SLP6MSD-062591	PCJ-SLP6FB-062591
SLP7	04/30/91	14773-BLK01	PCJ-SLP6D-043091	PCJ-SLP6MS-043091	PCJ-SLP6MSD-043091	NOT SAMPLED
QAPP/q	ltycont				,	

Well No.	Sample <u>Date</u>	Method Blank	Field Duplicate	<u>Matrix Spike</u>	Matrix Spike Dup	Field Blank
W48	NOT SAMPLED)				
SLP6	08/27/91	16687-BLK01	PCJ-SLP6D-082791	PCJ-SLP6MS-082791	PCJ-SLP6MSD-082791	PCJ-SLP6FB-082791
SLP7	08/27/91	16687-BLK01	PCJ-SLP7D-082791	PCJ-SLP7MS-082791	PCJ-SLP7MSD-082791	PCJ-SLP7FB-082791
W48	NOT SAMPLED)				
SLP6	SAMPLE DEST		•			
SLP7	SAMPLE DEST					
JLI 7	JAHI LE DEST	NOTED				
W406	05/08/91	14886-BLK01	PCJ-SLP14D-050891	PCJ-SLP16MS-050791	PCJ-SLP16MSD-050791	PCJ-SLP14FB-050891
W2	05/07/91	14812-BLK01	PCJ-SLP16D-050791	PCJ-SLP16MS-050791	PCJ-SLP16MSD-050791	PCJ-SLP16FB-050791
E13	05/07/91	14812-BLK01	PCJ-SLP16D-050791	PCJ-SLP16MS-050791	PCJ-SLP16MSD-050791	PCJ-SLP16FB-050791
Н3	NOT ACCESSI	BLE			•	
SLP10	05/01/91	14781-BLK01	IGV-W105D-050191	PCJ-SLP6MS-043091	PCJ-SLP6MSD-043091	IGV-W105FB-050191
SLP14	05/08/91	14886-BLK01	PCJ-SLP14D-050891	PCJ-SLP16MS-050791	PCJ-SLP16MSD-050791	PCJ-SLP14FB-050891
SLP16	05/07/91	14812-BLK01	PCJ-SLP6D-050791	PCJ-SLP16MS-050791	PCJ-SLP16MSD-050791	PCJ-SLP16FB-050791
W402	05/08/91	14886-BLK01	PCJ-SLP14D-050891	PCJ-SLP16MS-050791	PCJ-SLP16MSD-050791	PCJ-SLP14FB-050891
W403	05/08/91	14886-BLK01	PCJ-SLP14D-050891	PCJ-SLP16MS-050791	PCJ-SLP16MSD-050791	PCJ-SLP14FB-050891
W119	NOT ACCESSI	BLE				
W406	08/28/91	16727-BLK01	STP-SLP3D-082891	PCJ-SLP6MS-082791	PCJ-SLP6MSD-082791	STP-SLP3FB-082891
E2	082891	16727-BLK01	STP-SLP3D-082891	PCJ-SLP6MS-082791	PCJ-SLP6MSD-082791	STP-SLP3FB-082891

Well <u>No.</u>	Sample <u>Date</u>	Method Blank	Field Duplicate	<u>Matrix Spike</u>	Matrix Spike Dup	<u>Field Blank</u>
E13	08/28/91	16727-BLK02	STP-SLP3D-082891	PCJ-SLP6MS-082791	PCJ-SLP6MSD-082791	STP-SLP3FB-082891
13	NOT ACCESS	IBLE				
LP10	08/29/91	16769-BLK01	PCJ-SLP10D-082991	PCJ-SLP10MS-082991	PCJ-SLP10MSD-082991	PCJ-SLP6FB-082991
SLP14	08/27/91	16687-BLK01	PCJ-SLP6D-082791	PCJ-SLP6MS-082791	PCJ-SLP6MSD-082791	PCJ-SLP6FB-082791
SLP16	08/27/91	16887-BLK01	PCJ-SLP6D-082791	PCJ-SLP6MS-082791	PCJ-SLP6MSD-082791	PCJ-SLP6FB-082791
LP402	08/28/91	16727-BLK01	STP-SLP3D-082891	PCJ-SLP6MS-082791	PCJ-SLP6MSD-082791	STP-SLP3FB-082891
403	08/28/91	16727-BLK01	STP-SLP3D-082891	PCJ-SLP6MS-082791	PCJ-SLP5MSD-082791	STP-SLP3FB-0082891
119	NOT ACCESS	IBLE		•		
LP5	05/07/91	14812-BLK01	PCJ-SLP16D-050791	PCJ-SLP16MS-050791	PCJ-SLP16MSD-050791	PCJ-SLP16FB-050791
16	05/07/91	14812-BLK01	PCJ-SLP16D-050791	PCJ-SLP16MS-050791	PCJ-SLP16MSD-050791	PCJ-SLP16FB-050791
3	08/28/91	16727-BLK01	STP-SLP3D-082891	PCJ-SLP6MS-082791	PCJ-SLP6MSD-082791	STP-SLP3FB-082891
15	05/07/91	14812-BLK01	PCJ-SLP16D-050791	PCJ-SLP16MS-050791	PCJ-SLP16MSD-050791	PCJ-SLP16FB-050791
ITK6	05/08/91	14886-BLK01	PCJ-SLP14D-050891	PCJ-SLP16MS-050791	PCJ-SLP16MSD-050791	PCJ-SLP14FB-050891
129	05/08/91	14886-BLK01	PCJ-SLP14D-050891	PCJ-SLP16MS-050791	PCJ-SLP16MSD-050791	PCJ-SLP14FB-050891
140	05/08/91	14886-BLK01	PCJ-SLP14D-050891	PCJ-SLP16MS-050791	PCJ-SLP16MSD-050791	PCJ-SLP14FB-050891
170	05/08/91	14886-BLK01	PCJ-SLP14D-050891	PCJ-SLP16MS-050791	PCJ-SLP16MSD-050791	PCJ-SLP14FB-050891
1401	05/07/91	14812-BLK01	PCJ-SLP16D-050791	PCJ-SLP16MS-050791	PCJ-SLP16MSD-050791	PCJ-SLP16FB-050791
4 DO	02/07/01	14002 DI KO1	DC 1 CL DCD 020701		DC 1 CL DCHCD 020701	DC 3 CL DCCD 020701
LP8	03/27/91	14223-BLK01	PCJ-SLP6D-032791	PCJ-SLP6MS-032791	PCJ-SLP6MSD-032791	PCJ-SLP6FB-032791
SLP6	04/30/91	14773-BLK01	PCJ-SLP6D-043091	PCJ-SLP6MS-043091	PCJ-SLP6MSD-043091	PCJ-SLP6FB-043091
SLP6	07/18/91	15889-BLK01	PCJ-SLP6D-071891	PCJ-SLP6MS-071891	PCJ-SLP16MSD-071891	PCJ-SLP16FB-071891

•

PRAIRIE DU CHIEN-JORDAN AQUIFER PHENOLICS QUALITY CONTROL SUMMARY

Well <u>No.</u>	Sample <u>Date</u>	Method Blank	Field Duplicate	<u>Matrix Spike</u>	Matrix Spike Dup	<u>Field Blank</u>
W23	03/28/91	14236-BLK	DPV-W422TPD-032891	DPV-W422TPMS-032891	DPV-W422TPMSD-032891	DPV-W422TPFB-032891
W23	06/27/91	15612-BLK	DPV-W421TPD-062791	DPV-W421TPMS-062791	DPV-W421TPMSD-062791	DPV-W421TPFB-062791
W23	09/18/91	17193-BLK	DPV-W420TPD-091891	DPV-W420TPMS-091891	DPV-W422TPMSD-091891	DPV-W420TPFB-091891
W23	10/16/91	17984-BLK	DPV-W420TPD-101691	DPV-W420TPMS-101691	DPV-W422TPMSD-101691	DPV-W420TPFB-101691

APPENDIX C

LABORATORY DATA SUMMARY PACKAGE: PRAIRIE DU CHIEN-JORDAN AQUIFER

RAP SECTION 7.3.(B) MONITORING

1ST HALF - 1991

PAH MONITORING



CASE NARRATIVE

FOR

City of St. Louis Park

May 15, 1991

Enseco - RMAL Project Number 014232

Introduction

Nine aqueous samples (includes QC) were received at Enseco Rocky Mountain Analytical Laboratory on March 29, 1991. The samples were logged in under RMAL project number 014232. Sample DPV-W422FBD (RMA # 014232-07) was extracted and held as per the QAPP. A cross reference associating the RMAL sample numbers to the actual field sample numbers is included. The samples were analyzed for part-per-billion (ppb) polynuclear aromatic hydrocarbons (PAH).

Data Quality Assessment

The results contained in this report were reviewed relative to data acceptance criteria as specified in the April 1990 QAPP for completeness, precision, accuracy, representativeness and defensibility of the data. Unless otherwise stated below, no quality control problems or technical difficulties were encountered which would impact the interpretation or use of data in this report.

PPB PAH

Due to concentrations of target compounds present in excess of calibration range, samples 014232-01 and 02 were analyzed and reported at dilutions. Surrogates could not be measured due to the dilutions performed.

This data package is in compliance with the terms and conditions of the 1990 QAPP, both technically and for completeness, for other than the conditions detailed above.

Reported by:

Tracy Control

Date: 05-15-91

Data Control Supervis

Approved by:

Date: 5-15-9/

Joe'l Holtz Program Administrator

Enseco Incorporated 4955 Yarrow Street Arvada, Colorado 80002 303/421-6611 Fax: 303/431-7171



SAMPLE DESCRIPTION INFORMATION for City of St. Louis Park

Lab ID	Client ID	Matrix	Sampled Date Time	Received Date
014232-0001-SA 014232-0002-SA 014232-0003-SA 014232-0004-SA 014232-0004-MS 014232-0005-SA 014232-0006-SA 014232-0007-SA	DPV-W420-032891 DPV-W421-032891 BPV-W423-032891 PCJ-W23- DPV-W422 DPV-W422MS DPV-W422MSD DPV-W422D DPV-W422FB DPV-W422FB	AQUEOUS	28 MAR 91 28 MAR 91	29 MAR 91 29 MAR 91



Qualifier Codes and their Usage

- U = Indicates compound was analyzed for but not detected. The sample quantitation limit is corrected for dilution and for percent moisture. For soil samples subjected to GPC clean-up procedures, the CRQL (contract required quantitation limit) is multiplied by two to account for the fact that only half of the extract is recovered.
- J= Indicates an estimated value. This flag is used when the mass spectral data indicates the presence of a compound that meets the identification criteria but the result is less than the sample quantitation limit but greater than zero.
- B = This flag is used when the analyte is found in the associated blank as well as in the sample. B codes do not necessarily invalidate the data but are dependent upon the judgement of the reviewer in applying the validation guidelines. This flag is used for a TIC as well as for a positively identified target compound list (TCL) compound.
- E = This flag identifies compounds whose concentrations exceed the calibration range of the GC/MS instrument for that specific analysis.
- D = This flag identifies all compounds identified during a re-analysis of a diluted sample.
- A = This flag indicates that a TIC is a suspected aldol-condensation product.

14232-03

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

Contract No.: Lab Name: ENSECO-RMAL

Lab Code: ENSECO Case No.: 14232 SAS No.: SDG No.:

Lab Sample ID: 14232-03 Matrix: (soil/water) WATER

Sample wt/vol: 1000 (g/mL) ML Lab File ID: R5579

Date Received: 03/29/91 Level: (low/med) LOW

% Moisture: not dec. dec. Date Extracted: 04/01/91

Date Analyzed: 05/03/91 Extraction: (SepF/Cont/Sonc) CONT

GPC Cleanup: (Y/N) N pH: 7.0 Dilution Factor: 1.0

CONCENTRATION UNITS:

CAS NO.	COMPOUND	(ug/L or ug/Kg)	UG/L	Q
271-89-6	2,3-Benzofuran		10	บ
496-11-7	2,3-Dihydroinden	e	9.3	J
95-13-6	1H-Indene		2.2	J
91-20-3	Naphthalene		20	}
	Benzo(B)Thiophen	9	2.6	J
	Quinoline		10	ש
	1H-Indole		10	U
91-57-6	2-Methylnaphthal	ene	3.9	J
90-12-0	1-Methylnaphthal	ene	6.0	J
92-52-4	Biphenyl		2.2	J
208-96-8	Acenaphthylene	···	1.7	J
83-32-9	Acenaphthene		11	
132-64-9	Dibenzofuran	 	3.7	J
	Fluorene		8.4	J
132-65-0	Dibenzothiophene		10	ע
85-01-8	Phenanthrene		8.2	J
120-12-7	Anthracene		10	ט
1 200-34-0	ACT TOTHE		10	ן ט
86-74-8	Carbazole		1.5	J
206-44-0	Fluoranthene		3.8	J
129-00-0	Pyrene		3.3	J
56-55-3	Pyrene_ Benzo(A)Anthrace	ne	10	U
218-01-9	Chrysene		10	ט
205-99-2	Chrysene Benzo(B)Fluorantl	nene	10	ט
207-08-9	Benzo(K)Fluorantl	nene	10	ַ ט
192-97-2	Benzo(E)Pyrene		10	ט
50-32-8	Benzo(A) Pyrene		10	ט
198-55-0	Perylene	l l	10	ט
193-39-5	Indeno(1,2,3-CD)	Pyrene	10	ប
53-70-3	Dibenz(A,H)Anthra	acene	10	ע
191-24-2	Benzo(G,H,I)Pery	Lene	10	Ū



CASE NARRATIVE

for

City of St. Louis Park

July 26, 1991

Enseco - RMAL Project Number 015605

Introduction

Eight aqueous samples (including MS and MSD) were received at Enseco-Rocky Mountain Analytical Laboratory on June 28, 1991. The samples were logged in under RMAL project number 015605. Sample DPV-W421FBD-062791 (RMAL# 015605-05) was extracted and held as per the QAPP. A cross reference associating the RMAL sample numbers to the actual field sample numbers is included. The samples were analyzed for low level part-per-billion (ppb) polynuclear aromatic hydrocarbons (PAH).

Data Quality Assessment

The results contained in this report were reviewed relative to data acceptance criteria as specified in the 1990 QAPP for completeness, precision, accuracy, representativeness and defensibility of the data. Unless otherwise stated below, no quality control problems or technical difficulties were encountered which would impact the interpretation or use of data in this report.

PPB PAH

Samples 015605-01, 02, 03, 02MS, and 02MSD were diluted due to target compounds present in excess of calibration range. Surrogates could not be measured in these samples due to the dilutions performed.

This data package is in compliance with the terms and conditions of the 1989 QAPP, both technically and for completeness, for other than the conditions detailed above.

Reported by

e: 07-26-9

Da

Data Cobtrol Supervisor

Approved by: fall

∕**Z.** Holtz

Program Administrator

Date: 7-36-91

Enseco Incorporated 4955 Yarrow Street Arvada, Colorado 80002 303/421-6611 Fax. 303/431-7171



SAMPLE DESCRIPTION INFORMATION for City of St. Louis Park

Lab ID	Client ID	Matrix	Sampled Date Time	Received Date
015605-0001-SA 015605-0002-SA 015605-0002-MS 015605-0002-SD 015605-0003-SA 015605-0004-FB 015605-0005-FB	DPV-W420-062791 DPV-W421-062791 DPV-W421MS-062791 DPV-W421MSD-062791 DPV-W421D-062791 DPV-W421FB-062791 DPV-W421FBD-062791 PCJ-W23-062791	AQUEOUS AQUEOUS AQUEOUS AQUEOUS AQUEOUS AQUEOUS AQUEOUS AQUEOUS AQUEOUS	27 JUN 91 27 JUN 91	28 JUN 91 28 JUN 91

Enseco

Qualifier Codes and their Usage

- U = Indicates compound was analyzed for but not detected. The sample quantitation limit is corrected for dilution and for percent moisture. For soil samples subjected to GPC clean-up procedures, the CRQL (contract required quantitation limit) is multiplied by two to account for the fact that only half of the extract is recovered.
- J = Indicates an estimated value. This flag is used when the mass spectral data indicates the presence of a compound that meets the identification criteria but the result is less than the sample quantitation limit but greater than zero.
- **B** = This flag is used when the analyte is found in the associated blank as well as in the sample. B codes do not necessarily invalidate the data but are dependent upon the judgement of the reviewer in applying the validation guidelines. This flag is used for a TIC as well as for a positively identified target compound list (TCL) compound.
- E = This flag identifies compounds whose concentrations exceed the calibration range of the GC/MS instrument for that specific analysis.
- D = This flag identifies all compounds identified during a re-analysis of a diluted sample.
- A = This flag indicates that a TIC is a suspected aldol-condensation product.

1B SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

15605-06

EPA SAMPLE NO.

Contract No.: Lab Name: ENSECO

Lab Code: ENSECO Case No.: 15605 SAS No.: SDG No.:

Lab Sample ID: 15605-06 Matrix: (soil/water) WATER

Lab File ID: Sample wt/vol: 1060 (g/mL) ML R6399

Date Received: 06/28/91 Level: (low/med) LOW

% Moisture: not dec. dec. Date Extracted: 06/29/91

Date Analyzed: 07/18/91 Extraction: (SepF/Cont/Sonc) CONT

GPC Cleanup: (Y/N) N pH: 7.0 Dilution Factor: 0.943

CONCENTRATION UNITS:

2,3-Benzofuran 2,3-Dihydroindene_ 1H-Indene Naphthalene Benzo(B)Thiophene_ Quinoline	9.4 7.3 1.7 21 1.9	J J
1H-Indene Naphthalene Benzo(B)Thiophene Quinoline	1.7	-
1H-Indene Naphthalene Benzo(B)Thiophene Quinoline	21	J
Benzo(B)Thiophene_ Quinoline		
Quinoline	1.9	
		J
	9.4	Ū
1H-Indole	9.4	ט (
2-Methylnaphthalen	e 2.8	J
1-Methylnaphthalen	e 4.3	J
Biphenyl	1.5	J
Acenaphthylene	1.2	J
Acenaphthene	8.1	J
Dibenzofuran	3.1	J
	6.5	J
Dibenzothiophene	9.4	ט
Phenanthrene	6.9	J
Anthracene ·	9.4	ט
Acridine	9.4	ט
Carbazole	9.4	ט
Fluoranthene	2.9	J
	2.6	J
	9.4	Ū
Chrysene	9.4	שו
Benzo(B) Fluoranthe		ס
Benzo (K) Fluoranthe	ne 9.4	ט
Benzo(E)Pyrene	9.4	ט ו
Benzo(A)Pyrene	9.4	Ū
Pervlene	9.4	ΙŪ
Indeno(1,2,3-CD)Py	rene 9.4	Ŭ
Dibenz (A.H) Anthrac	ene 9.4	Ü
Benzo(G,H.I)Pervle	ne 9.4	ا ت
	1-MethylnaphthalenBiphenylAcenaphthyleneAcenaphtheneDibenzofuranFluoreneDibenzothiophenePhenanthreneArthraceneAcridineCarbazoleFluorantheneBenzo(A)AnthraceneBenzo(B)FluorantheBenzo(B)FluorantheBenzo(B)PyreneBenzo(B)PyreneBenzo(B)PyreneBenzo(B)PyreneBenzo(B)PyreneBenzo(B)PyreneBenzo(B)PyreneBenzo(B)Pyrene	1-Methylnaphthalene 4.3Biphenyl 1.5Acenaphthylene 8.1Dibenzofuran 3.1Fluorene 6.5Dibenzothiophene 9.4Phenanthrene 9.4Acridine 9.4Carbazole 9.4Fluoranthene 2.9Pyrene 2.6Benzo(A) Anthracene 9.4Benzo(B) Fluoranthene 9.4Benzo(C) Pyrene 9.4Benzo(C) Pyrene 9.4Benzo(A) Pyrene 9.4Perylene 9.4Perylene 9.4Perylene 9.4Perylene 9.4Perylene 9.4Dibenz(A, H) Anthracene 9.4

PHENOLICS MONITORING



April 24, 1991

Mr. James Grube City of St. Louis Park 5005 Minnetonka Blvd. St. Louis Park, MN 55416

Dear Mr. Grube:

Enclosed is the report for ten aqueous samples (including QC) received at Enseco-Rocky Mountain Analytical Laboratory on March 29, 1991.

If you have any questions, please do not hesitate to call.

Sincerely,

Joel E. Holtz

Program Administrator

JH/dk

RMAL #14236

U.S.EPA - CLP

COVER PAGE - INORGANIC ANALYSES DATA PACKAGE

0000001

Lab Name:	ROCKY MOUI	NTAIN ANALYTIC	AL Contract:	
Lab Code:	ENSECO	Case No.:	SAS No.:	SDG No.:
SOW No:	7/88			
	EPA Sam	ole No.	Lab Sample ID.	
	1423601		DPV-W420TP-0328	a 1
	1423602		DPV-W421TP-0328	
	1423602 1423603		DPV-W421TF-0328	
	1423603		DPV-W422TPMSD-0	
	1423603		DPV-W422TPMS-03	
	1423603. 1423604		DPV-W422TPD-032	
	<u>1423605</u>		DPV-W422TPFB-03	
	<u>1423606</u>		DPV-W422TPFBD-0	
	1423607		PCV-W23TP-03289	
	<u>1423608</u>		<u> IGV-W10STP-0328</u>	91
				
				
				
Paramete		ethod No. 420.1	Detection Limits 5 ug/L	<u>Source</u> 1
Comments: FIVE WATER SAMPLES FOR PPB PHENOLS ANALYSIS. RMA OC#14236				
Release	Methods for Cincinnati. of the data	a contained in	ysis of Water and Wast this hardcopy data pa ager or the Manager's	ckage has been
		llowing signat	cure.)
			Lab Manager:	em Zang
			Date: 4/19	1/91

COVER PAGE - IN

Project# 14236

Samples 01 through 08 were analyzed on 4/01/91. We realize sample 06 is a duplicate of 05 and that this is a field blank. Sample 06 was slightly over the detection limit so we decided to reanalyze the sample on 4/18/91. The result for the latter date was reported. All raw data are included.

Laboratory Supervisor <u>Jame Jama</u>

C - Concentration Qualifier:

Enter a "B" if the reported value is less than the Contract Required Detection Limit (CRDL) but greater than the Instrument Detection Limit (IDL). If the analyte was analyzed for but not detected, a "U" must be entered.

Q - Quality Control Qualifiers:

- E The reported value is estimated because of the presence of interference. An explanatory note must be included under Comments on the cover Page (if the problem applies to all samples) or on the specific FORM I-IN (if it is an isolated problem).
- M Duplicate injection precision not met.
- N Spiked sample recovery not within control limits.
- S The reported value was determined by the Method of Standard Additions (MSA).
- W Post-digestion spike for Furnace AA analysis is out of control limits (85-115%), while sample absorbance is less than 50% of spike absorbance.
- * Duplicate analysis not within control limits.
- + Correlation coefficient for the MSA is less than 0.995.

Entering "S", "W", or "+" is mutually exclusive. No combination of these qualifiers can appear in the same field for an analyte.

M - Method Qualifier:

```
"P"
      for ICP
"A"
     for Flame AA
nFn
     for Furnace AA
     for Manual Cold Vapor AA
"CV"
"AV"
     for Automated Cold Vapor AA
     for Semi-Automated Spectrophotometric
"AS"
"C"
     for Manual Spectrophotometric
"T"
     for Titrimetric
"NR" if the analyte is not required to be analyzed
```

1423607

INORGANIC ANALYSIS DATA SHEET

0000010

CKY MOUNTAIN AN	ALYTICAL C	Contract	t:
SECO Case N	o.: SAS No.		_ SDG No.:
/water): <u>WATER</u>	Lab Sample	ID: <u>P</u>	CV-W23TP-032891
med): <u>LOW</u>	Date Recei	ved: 0:	3/29/91
0.0			
Con	centration Units: <u>u</u>	ıg/L	
Analyte	Concentration	С	Q
PHENOLS	5	Ū	
: <u>COLORLESS</u> C1	arity Before: <u>CLEAR</u>	R	Texture:
: c	Clarity After:		_ Artifacts:
	/water): WATER med): LOW	/water): WATER Lab Sample med): LOW Date Recei	Concentration Units: ug/L Analyte Concentration C



July 18, 1991

Mr. James Grube City of St. Louis Park 5005 Minnetonka Blvd. St. Louis Park, MN 55416

Dear Mr. Grube:

Enclosed is the report for ten aqueous samples (includes QC) received at Rocky Mountain Analytical Laboratory on June 28, 1991.

If you have any questions, the Program Administrator assigned to this project is Joel Holtz.

Sincerely,

Joel Holtz

Program Administrator

JH/cm

Enclosures

RMAL# 15612

Lab Name: ROCKY MOUNTAIN ANALYTICAL Project No.

Sample Numbers

RMA SAMPLE NO	CLIENT SAMPLE ID
<u> 1561201</u>	DPV-W420TP-062791
1561202	DPV-W421TP-062791
1561202D	DPV-W421TPMSD-062791
1561202S	DPV-W421TPMS-062791
1561203	DPV-W421TPD-062791
1561204	DPV-W421TPFB-062791
1561205	DPV-W421TPFBD-062791
1561206	PCV-W23TP-062791
1561207	IGV-W10STP-062791
1561208	STP-W410TP-062791

PARAMETERS_	METHOD NO.	DETECTION LIMIT	SOURCE
Phenol	420.1	5 ug/l	1

Co	mm	en	t.	S	:

 EIGHT	WATER	SAMPLES	FOR	PPB	PHENOLICS	ANALYSIS		
RMA O	C# 156:	12.						
		-					-	

SOURCE:

1="Methods for Chemical Analysis of Water and Wastes", USEPA-EMSL, Cincinnati.

Release of the data contained in this hardcopy data package has been authorized by the Laboratory Manager or the Manager's designee, as verified by the following signature.

Lab Manager:

Date: 7/(c/g)

Project # 15612

The samples for this project were prepped for phenol on 7/05/91. On that date 100 mls of sample were prepped. For a reporting limit of 0.05 ppb we distill 200 mls of sample. Since the samples had limited volume 100 more mls were distilled on 7/12/91 and added to the distillate from the first date for a final volume of 200 mls.

Laboratory Supervisor Inn Xano

RESULT QUALIFIERS

C - Concentration Qualifier:

Enter a "B" if the reported value is less than the Contract Required Detection Limit (CRDL) but greater than the Instrument Detection Limit (IDL). If the analyte was analyzed for but not detected, a "U" must be entered.

Q - Quality Control Qualifiers:

- E The reported value is estimated because of the presence of interference. An explanatory note must be included under Comments on the cover Page (if the problem applies to all samples) or on the specific FORM I-IN (if it is an isolated problem).
- M Duplicate injection precision not met.
- N Spiked sample recovery not within control limits.
- S The reported value was determined by the Method of Standard Additions (MSA).
- W Post-digestion spike for Furnace AA analysis is out of control limits (85-115%), while sample absorbance is less than 50% of spike absorbance.
- * Duplicate analysis not within control limits.
- + Correlation coefficient for the MSA is less than 0.995.

Entering "S", "W", or "+" is mutually exclusive. No combination of these qualifiers can appear in the same field for an analyte.

M - Method Qualifier:

"P"	for ICP
"A"	for Flame AA
"f"	for Furnace AA
"CV"	for Manual Cold Vapor AA
"AV"	for Automated Cold Vapor AA
"AS"	for Semi-Automated Spectrophotometric
"C"	for Manual Spectrophotometric
"T"	for Titrimetric
"NR"	if the analyte is not required to be analyzed

000009

RMA SAMPLE NO 1561206

CLIENT ID NO PCV-W23TP-062791

INORGANIC ANALYSIS DATA SHEET

Lab Name: ROCKY MOUNTAIN ANALYTICAL

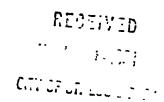
						_	·
				Proj	ec	t No:	
Matrix (soil/ Level (low/m	<pre>water): WATE</pre>	<u>R</u>	Date Received:			eived:	06/28/91
% Solids:	0.0						
	Analyte	Conc	entratio	n	С	Q	Concentration Units
	Phenol		5	. —	ם		ug/L
		1				-	
•							
Color Before:	COLORLESS	Clarity	Before:	CLEAR	<u>₹</u>	_ Te	exture:
Color After:		Clarity	After:			_ Aı	ctifacts:
COMMENTS:				-			

RAP SECTION 7.3.(B) MONITORING

2ND HALF - 1991







CASE NARRATIVE

FOR

City of St. Louis Park

November 01, 1991

Enseco - RMAL Project Number 017191

Introduction

Ten aqueous samples (includes QC) were received at Enseco Rocky Mountain Analytical Laboratory on September 19, 1991. The samples were logged in under RMAL project number 017191. Sample DPV-W420FBD-091891 (RMAL # 17191-05) was extracted and inadvertently analyzed. This data is reported, however there will be no charge for the analysis as this sample was to be extracted and held per the 1990 QAPP. A cross reference associating the RMAL sample numbers to the actual field sample numbers is included. The samples were analyzed for part-per-billion (ppb) polynuclear aromatic hydrocarbons (PAH).

Data Quality Assessment

The results contained in this report were reviewed relative to data acceptance criteria as specified in the April 1990 QAPP for completeness, precision, accuracy, representativeness and defensibility of the data. Unless otherwise stated below, no quality control problems or technical difficulties were encountered which would impact the interpretation or use of data in this report.

PPB PAH

Samples 17191-01, 02, 03, 06, 02MS and 02MSD were analyzed at dilutions due to target compounds present in excess of calibration range. With the exception of sample -01, surrogates could not be measured in the above samples due to the dilutions performed.

Matrix spike/spike duplicate recoveries could not be calculated for -02MS and 02MSD due to the level of spike compounds present in the associated sample. Several spike compounds were diluted out as well. All recoveries and RPD's are reprited as "NC" (not calculated).

Enseco Incorporated 4955 Yarrow Street Arvada, Colorado 80002 303/421-6611 Fax. 303/431-7171



Case Narrative - RMAL #017191 November 01, 1991 Page Two

This data package is in compliance with the terms and conditions of the 1990 QAPP, both technically and for completeness, for other than the conditions detailed above.

Reported by

Diacy Controy

Data Control Supervisor

Approved by: 1

Debbie Fazio

Program Administrator

Date: ///*01/9/*

Date: // 01 /91



SAMPLE DESCRIPTION INFORMATION for City of St. Louis Park

		:	Sampl	ed	Received
Lab ID	Client'ID	Matrix	Date '	Time	Date
017191-0001-SA 017191-0002-SA 017191-0002-MS 017191-0002-SD 017191-0003-SA 017191-0004-SA 017191-0006-SA 017191-0006-SA	DPV-W421-091891 DPV-W420-091891 DPV-W420MS-091891 DPV-W420MSD-091891 DPV-W420D-091891 DPV-W420FB-091891 DPV-W420FBD-091891 WTF-ACLE-091891	AQUEOUS	18 SEP 91 18 SEP 91	1	19 SEP 91 19 SEP 91
017191-0008-SA	PCJ-W23-091891	AQUEOUS	18 SEP 91		19 SEP 91



Qualifier Codes and their Usage

- U = Indicates compound was analyzed for but not detected. The sample quantitation limit is corrected for dilution and for percent moisture. For soil samples subjected to GPC clean-up procedures, the CRQL (contract required quantitation limit) is multiplied by two to account for the fact that only half of the extract is recovered.
- J = Indicates an estimated value. This flag is used when the mass spectral data indicates the presence of a compound that meets the identification criteria but the result is less than the sample quantitation limit but greater than zero.
- N = Indicates presumptive evidence of a compound. This flag is only used for tentatively identified compounds, where the identification is based on a mass spectral library search. It is applied to all TIC results.
- P = This flag is used for a pesticide/Aroclor target analyte when there is greater than 25% difference for detected concentrations between the two GC columns. The lower of the two values is reported.
- B = This flag is used when the analyte is found in the associated blank as well as in the sample. B codes do not necessarily invalidate the data but are dependent upon the judgement of the reviewer in applying the validation guidelines. This flag is used for a TIC as well as for a positively identified target compound list (TCL) compound.
- E = This flag identifies compounds whose concentrations exceed the calibration range of the GC/MS instrument for that specific analysis.
- D = This flag identifies all compounds identified during a re-analysis of a diluted sample.
- A = This flag indicates that a TIC is a suspected aldol-condensation product.

1B

EPA SAMPLE NO. SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

17191-08

Contract No.: Lab Name: ENSECO

Lab Code: ENSECO Case No.: 17191 SAS No.: SDG No.:

Lab Sample ID: 17191-08 Matrix: (soil/water) WATER

Lab File ID: R7301 Sample wt/vol: 1060 (g/mL) ML

Level: (low/med) Date Received: 09/19/91 LOW

% Moisture: not dec. dec. Date Extracted: 09/21/91

Extraction: (SepF/Cont/Sonc) CONT Date Analyzed: 10/14/91

GPC Cleanup: (Y/N) N pH: 7.0 Dilution Factor: .943

CONCENTRATION UNITS:

CAS NO.	COMPOUND ('ue	g/L or ug/Kg) UG/L	Q
271-89-6	2,3-Benzofuran_	9.4	U
496-11-7	2,3-Dihydroindene_	8.3	J
	1H-Indene	2.2	J
91-20-3	Naphthalene	27	1
4565-32-6	Benzo(B)Thiophene_	2.3	J
91-22-5	Quinoline	9.4	ט
120-72-9	1H-Indole	9.4	ט
91-57-6	2-Methylnaphthalen	e 4.7	J
90-12-0	1-Methylnaphthalen	e6.4	J
92-52-4	Biphenyl	2.0	j
208-96-8	Acenaphthylene	1.6	j j
83-32-9	Acenaphthene	10] n
132-64-9	Dibenzofuran	3.8	J
86-73-7	Fluorene	7.9	J
132-65-0	Dibenzothiophene_	9.4	ן ט
85-01-8	Phenanthrene	7.6	J
120-12-7	Anthracene	9.4	υ
260-94-6	Acridine _	9.4	ט
86-74-8	Carbazole	1.3	J
206-44-0	Fluoranthene	3.3	J
700 00 0	There are a	1 20	J
56-55-3	Benzo(A)Anthracene	9.4	ט
1 210-01-3	chrysene	1 3.4	U
205-99-2	Benzo(B) Fluoranthe	ne9.4	ប
207-08-9	Benzo(K) Fluoranthe	ne9.4	U
192-97-2	Benzo(E)Pyrene	9.4	U
50-32-8	Benzo(A)Pvrene	9.4	U
198-55-0	Perylene	9.4	ซ
193-39-5	Perylene Indeno(1,2,3-CD)Py	rene 9.4	ប
53-70-3	Dibenz(A,H)Anthrac	ene 9.4	U
191-24-2	Benzo(Ġ,Ĥ,ĺ)Peryle	ne9.4	ប



CASE NARRATIVE

FOR

City of St. Louis Park

December 10, 1991

Enseco - RMAL Project Number 017977

Introduction

Nine aqueous samples (includes QC) were received at Enseco Rocky Mountain Analytical Laboratory on October 18, 1991. The samples were logged in under RMAL project number 017977. Sample DPV-W422FBD (RMA # 017977-07) was extracted and inadvertently analyzed and reported. You will not be charged for the analysis. A cross reference associating the RMAL sample numbers to the actual field sample numbers is included. The samples were analyzed for part-per-billion (ppb) polynuclear aromatic hydrocarbons (PAH).

Data Quality Assessment

The results contained in this report were reviewed relative to data acceptance criteria as specified in the April 1990 QAPP for completeness, precision, accuracy, representativeness and defensibility of the data. Unless otherwise stated below, no quality control problems or technical difficulties were encountered which would impact the interpretation or use of data in this report.

PPB PAH

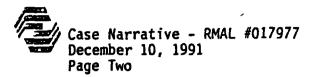
Due to concentrations of target compounds present in excess of calibration range, samples 017977-02 and 03 were analyzed and reported at dilutions. Surrogates could not be measured due to the dilutions performed.

In the original analysis of sample 017977-03 Naphthalene was saturated. Hence, a reanalysis at an additional dilution was performed for this component. Both sets of data is included in the data package.



SAMPLE DESCRIPTION INFORMATION for City of St. Louis Park

			Sampled	Received
Lab ID	Client ID	Matrix	Date Tim	e Date
017977-0001-SA	PCJ-W23-101691	AQUEOUS AQUEOUS AQUEOUS AQUEOUS AQUEOUS AQUEOUS AQUEOUS	16 OCT 91	17 OCT 91
017977-0002-SA	DPV-W420-101691		16 OCT 91	17 OCT 91
017977-0003-SA	DPV-W421-101691		16 OCT 91	17 OCT 91
017977-0004-SA	DPV-W422-101691		16 OCT 91	17 OCT 91
017977-0004-MS	DPV-W422MS-101691		16 OCT 91	17 OCT 91
017977-0004-SD	DPV-W422MSD-101691		16 OCT 91	17 OCT 91
017977-0005-SA	DPV-W422D-101691	AQUEOUS	16 OCT 91	17 OCT 91
017977-0006-SA	DPV-W422FB-101691	AQUEOUS	16 OCT 91	17 OCT 91
017977-0007-SA	DPV-W422FBD-101691	AQUEOUS	16 OCT 91	17 OCT 91



This data package is in compliance with the terms and conditions of the 1990 QAPP, both technically and for completeness, for other than the conditions detailed above.

Reported by:

Tracy Compy

Date: 12/10/91

Approved by:

dulie Kramer

Program Administrator

Date: 12 /0 /99/



Qualifier Codes and their Usage

- U = Indicates compound was analyzed for but not detected. The sample quantitation limit is corrected for dilution and for percent moisture. For soil samples subjected to GPC clean-up procedures, the CRQL (contract required quantitation limit) is multiplied by two to account for the fact that only half of the extract is recovered.
- J = Indicates an estimated value. This flag is used when the mass spectral data indicates the presence of a compound that meets the identification criteria but the result is less than the sample quantitation limit but greater than zero.
- N = Indicates presumptive evidence of a compound. This flag is only used for tentatively identified compounds, where the identification is based on a mass spectral library search. It is applied to all TIC results.
- P = This flag is used for a pesticide/Aroclor target analyte when there is greater than 25% difference for detected concentrations between the two GC columns. The lower of the two values is reported.
- B = This flag is used when the analyte is found in the associated blank as well as in the sample. B codes do not necessarily invalidate the data but are dependent upon the judgement of the reviewer in applying the validation guidelines. This flag is used for a TIC as well as for a positively identified target compound list (TCL) compound.
- E = This flag identifies compounds whose concentrations exceed the calibration range of the GC/MS instrument for that specific analysis.
- D = This flag identifies all compounds identified during a re-analysis of a diluted sample.
- A = This flag indicates that a TIC is a suspected aldol-condensation product.

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

17977-01

Lab Name: ENSECO Contract No.:

Lab Code: ENSECO Case No.: 17977 SAS No.: SDG No.:

Matrix: (soil/water) WATER Lab Sample ID: 17977-01

Sample wt/vol: 1060 (g/mL) ML Lab File ID: R7904

Level: (low/med) LOW Date Received: 10/18/91

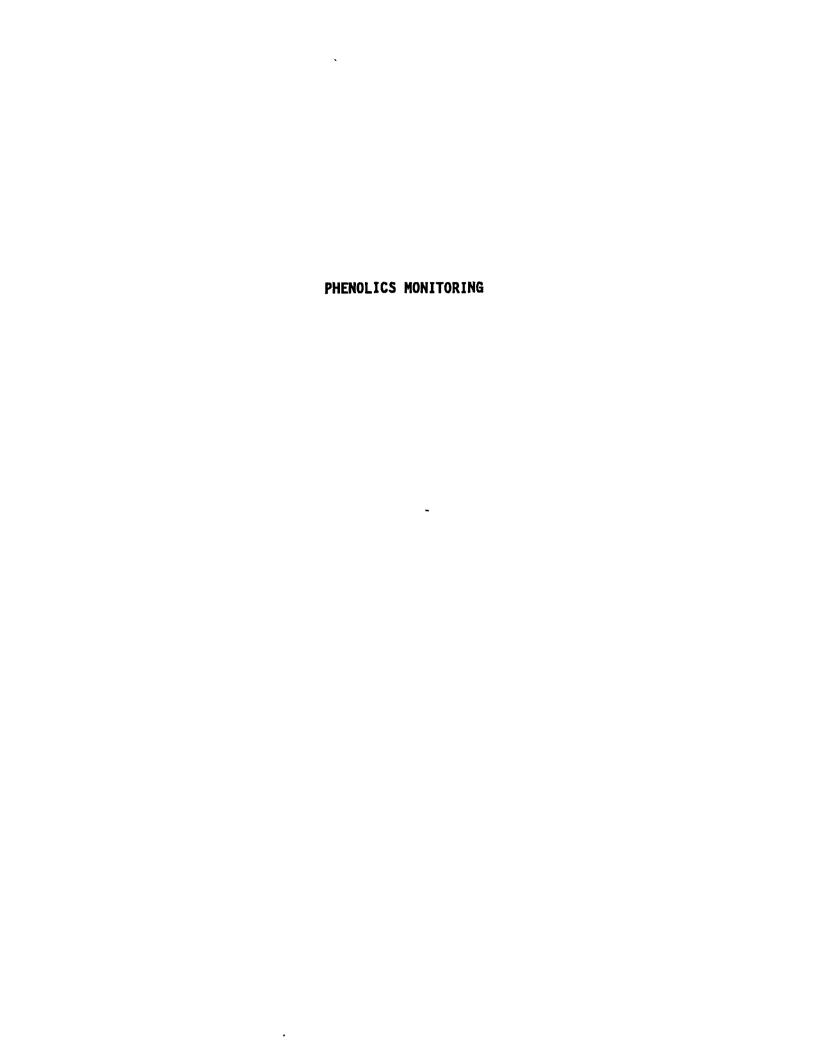
% Moisture: not dec. dec. Date Extracted: 10/20/91

Extraction: (SepF/Cont/Sonc) CONT Date Analyzed: 11/25/91

GPC Cleanup: (Y/N) N pH: 7.0 Dilution Factor: .943

CONCENTRATION UNITS:

CAS NO.		ig/L or ug/Kg) UG/L	Q
	2,3-Benzofuran	9.4	U
496-11-7	2.3-Dihvdroindene	7.5	J
95-13-6	1H-Indene	1.9	J
91-20-3	Naphthalene	25	
4565-32-6	Benzo(B)Thiophene	1.9	J
91-22-5	Quinoline	9.4	U
120-72-9	1H-Indole	9.4	U
91-57-6	2-Methylnaphthaler	1.0	J
i 90-12-0	1-Methylnaphthaler	ie 5.8	J
92-52-4	Biphenyl	1.7	J
208-96-8	Acenaphthylene	1.3	J
83-32-9	Acenaphthene	9.6	
132-64-9	Dibenzofuran	/ 3.4	J
			J
132-65-0	Fluorene Dibenzothiophene	9.4	ט
85-01-8	Phenanthrene .	7.5	J
120-12-7	Anthracene	9.4	ן ט
260-94-6	Acridine	9.4	ט (
86-74-8	Carbazole	1 9.4	ט (
206-44-0	Fluoranthene	1 3.2	J
129-00-0	Pyrene	2.7	J
56-55-3	PyreneBenzo(A) Anthracene	9.4	υ.
218-01-9	ChryseneBenzo(B)Fluoranthe	9.4	ט (
205-99-2	Benzo(B) Fluoranthe	ene 9.4	ט
207-08-9	Benzo(K)Fluoranthe	ene 9.4	ט
192-97-2	Benzo(E)Pyrene	9.4	ט
50-32-8	Benzo(A)Pyrene	9.4	Ū
198-55-0	Perylene	9.4	ט
193-39-5	Perylene Indeno(1,2,3-CD)Py	rene 9.4	ט
53-70-3	Dibenz(A,H)Anthrac	ene 9.4	ט
191-24-2	Benzo(G,H,I)Peryle	ene9.4	Ū





RECIVED

Commission of the com

October 16, 1991

Mr. James Grube City of St. Louis Park 5005 Minnetonka Blvd. St. Louis Park, MN 55416

Dear Mr. Grube:

Enclosed is the report for eleven aqueous samples (includes QC) received at Enseco-Rocky Mountain Analytical Laboratory on September 19, 1991.

If you have any questions, please do not hesitate to call.

Sincerely,

Joel Holtz

Program Administrator

JH/cm

Enclosures

RMAL #17193

U.S.EPA - CLP

COVER PAGE - INORGANIC ANALYSES DATA PACKAGE COOM 1.

Lab	Name:	ROCKY MOUN	ITAIN ANALYTIC	CAL Contra	ct:	
Lab	Code:	ENSECO	Case No.: _	SAS No.:	SDG	No.:
SOW	No:	7/88				
		EPA Samp 1719301	ole No.	Lab Samp PCJ-W23TP		
		1719301 1719302		IGV-W105T		-
		1719302 1719303		STP-W410T		-
		1719304		DPV-W422T		_
		1719305		DPV-W421T		-
		1719306		DPV-W420T		_
		1719306N			PMSD-09189:	<u> </u>
		1719306N	IS		PMS-091891	-
		1719307		DPV-W420T	PD-091891	_
		1719308		DPV-W420T	PFB-091891	- -
		1719309		DPV-W420T	PFBD-091891	Ţ
		•				<u>-</u>
						- -
						_
						-
						_
<u>Par</u>	amete:	rs <u>M</u> e	ethod No.	Detection Limi	<u>ts</u>	Source
PHE	ENOLIC	S 42	20.1	5 ug/L		1
<u>N</u>]	ments <u>NE WA</u> IA OC#	TER SAMPLES	S FOR PPB PHEN	NOLICS ANALYSIS.		
				•		
Sou			Chemical Anal	lysis of Water an	d Wastewate	er,"
aut	horiz	ed by the 1		n this hardcopy d nager or the Mana cure.		
				Lab Manager:	(Inne	Jang)
				Date:	10/16/9	

COVER PAGE - IN

RESULT QUALIFIERS

C - Concentration Qualifier:

Enter a "B" if the reported value is less than the Contract Required Detection Limit (CRDL) but greater than the Instrument Detection Limit (IDL). If the analyte was analyzed for but not detected, a "U" must be entered.

Q - Quality Control Qualifiers:

- E The reported value is estimated because of the presence of interference. An explanatory note must be included under Comments on the cover Page (if the problem applies to all samples) or on the specific FORM I-IN (if it is an isolated problem).
- . M Duplicate injection precision not met.
 - N Spiked sample recovery not within control limits.
 - S The reported value was determined by the Method of Standard Additions (MSA).
 - W Post-digestion spike for Furnace AA analysis is out of control limits (85-115%), while sample absorbance is less than 50% of spike absorbance.
 - * Duplicate analysis not within control limits.
 - + Correlation coefficient for the MSA is less than 0.995.

Entering "S", "W", or "+" is mutually exclusive. No combination of these qualifiers can appear in the same field for an analyte.

M - Method Qualifier:

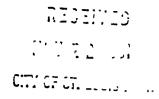
- "P" for ICP
- "A" for Flame AA
- "F" for Furnace AA
- "CV" for Manual Cold Vapor AA
- "AV" for Automated Cold Vapor AA
- "AS" for Semi-Automated Spectrophotometric
- "C" for Manual Spectrophotometric
- "T" for Titrimetric
- "NR" if the analyte is not required to be analyzed

1719301

€000: °3

INORGANIC ANALYSIS DATA SHEET

Lab Name: ROC	KY MOUNTAIN ANA	ALYTICAL Co	ntract	t:	
Lab Code: ENS	ECO Case No	o.: SAS No.:		_ SDG No.:	 -
Matrix (soil/	water): <u>WATER</u>	Lab Samp	le ID	: PCJ-W23TP-091	<u>891</u>
Level (low/m	ed): LOW	Date Rec	eived	: 09/19/91	
% Solids:	0.0				
	Conc	entration Units: ug	<u>/L</u>		
	Analyte	Concentration	С	Q	
	PHENOLICS	5	Ū		
Color Before:	COLORLESS Cla	arity Before: <u>CLEAR</u>		Texture:	
Color After:	c	larity After:	·	_ Artifacts:	
Comments:	·				





November 18, 1991

Mr. James Grube City of St. Louis Park 5005 Minnetonka Blvd. St. Louis Park, MN 55416

Dear Mr. Grube:

Enclosed is the report for eleven aqueous samples (includes QC) received at Enseco-Rocky Mountain Analytical Laboratory on October 17, 1991.

If you have any questions, please do not hesitate to call.

Sincerely,

Debbie Fazio

Program Administrator

DF/cm Enclosures

RMAL #17984

COVER PAGE - INORGANIC ANALYSES DATA PACKAGE

ab	Name:	ROCKY MOUN	TAIN ANALS	TICAL	-	Contract:		
Lab	Code:	ENSECO	Case No.:		SAS	No.:	_ SDG No.	:
SOW	No.:	7/88				•		
		EPA Sample	S SD			Lab Sam PCJ-W23TP- DPV-W420TM DPV-W421TM IGV-W105TM STP-W410TM DPV-W422TM DPV-W422TM DPV-W422TM DPV-W422TM DPV-W422TM DPV-W422TM DPV-W422TM DPV-W422TM	P-101691 P-101691 P-101691 P-101691 PMS-101691 PMSD-10169 PD-101691 PFB-101691	1
Pho	ramete:	5	ethod No. 420.1		5	tion Limits ug/L		Source 1
		ER SAMPLES 17984	FOR PPB P	HENOLICS	ANA	TISTS.		
		···						
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				Lab N	lanag	er:	nne Lar	20/
					Da	te:	18/91	<u>U</u>

COVER PAGE - IN

COOCC1-A

RESULT QUALIFIERS

C - Concentration Qualifier:

Enter a "B" if the reported value is less than the Contract Required Detection Limit (CRDL) but greater than the Instrument Detection Limit (IDL). If the analyte was analyzed for but not detected, a "U" must be entered.

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- N Spiked sample recovery not within control limits.
- S The reported value was determined by the Method of Standard Additions (MSA).
- W Post-digestion spike for Furnace AA analysis is out of control limits (85-115%), while sample absorbance is less than 50% of spike absorbance.
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Entering "S", "W", or "+" is mutually exclusive. No combination of these qualifiers can appear in the same field for an analyte.

M - Method Qualifier:

"P" for ICP

"A" for Flame AA

"f" for Furnace AA

"CV" for Manual Cold Vapor AA

"AV" for Automated Cold Vapor AA

"AS" for Semi-Automated Spectrophotometric

"C" for Manual Spectrophotometric

"T" for Titrimetric

"NR" if the analyte is not required to be analyzed

0000772401

INORGANIC ANALYSIS DATA SHEET

Lab Name: <u>ROC</u>	<u>CKY MOUNTAIN AN</u>	ALYTICAL	Contract	:	<u>-</u> _
Lab Code: ENS	SECO Case N	o.: SAS No	·:	SDG No.	:
Level (low/m	ned): <u>LOW</u>	Lab Sa Date R centration Units:	eceived:		
	Analyte	Concentration	c	Q	
•	Phenolics	5	ט		
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Color After:	: c	larity After:		Artifacts	s:
Comments:					

7/88

RAP SECTION 7.3.(C) MONITORING

1ST QUARTER - 1991



CASE NARRATIVE

FOR

City of St. Louis Park

May 2, 1991

Enseco - RMAL Project Number 014223

<u>Introduction</u>

Thirteen aqueous samples (including MS and MSD) were received at Enseco - Rocky Mountain Analytical Laboratory on March 28, 1991. The samples were logged in under RMAL project number 014223. Sample PCJ-SLP6FBD-032791 (RMAL # 014223-05) was extracted and held as per the QAPP. A cross reference associating the RMAL sample numbers to the actual field sample numbers is included. The samples were analyzed for low and medium level part-pertrillion (PPT) polynuclear aromatic hydrocarbons (PAH).

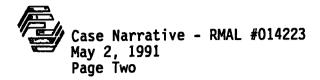
Data Quality Assessment

The results contained in this report were reviewed relative to data acceptance criteria as specified in the 1990 QAPP for completeness, precision, accuracy, representativeness and defensibility of the data. Unless otherwise stated below, no quality control problems or technical difficulties were encountered which would impact the interpretation or use of data in this report.

PPT PAH

All the samples and the associated method blank BLKO1 show target compounds that do not meet secondary ion confirmation criteria. In some instances a compound that does not meet secondary ion confirmation criteria may still be determined to be present in the sample after close inspection of the data by the analyst. Supportive data includes mass chromatograms maxima at the same scan for primary and secondary ions, as well as discernible quantitation interference with the secondary ion. These compounds are flagged with asterisk (*) on the data sheets (Form I) as per the 1990 QAPP.

Enseco Incorporated 4955 Yarrow Street Arvada, Colorado 80002 303/421-6611 Fax: 303/431-7171



This data package is in compliance with the terms and conditions of the 1990 QAPP, both technically and for completeness, for other than the conditions detailed above.

Reported by:

Tracy Compoy
Data Control Supervisor

Approved by:

Date: 2 may 1991

Joel Holtz

Program Administrator



Qualifier Codes and their Usage

- U = Indicates compound was analyzed for but not detected. The sample quantitation limit is corrected for dilution and for percent moisture. For soil samples subjected to GPC clean-up procedures, the CRQL (contract required quantitation limit) is multiplied by two to account for the fact that only half of the extract is recovered.
- J = Indicates an estimated value. This flag is used when the mass spectral data indicates the presence of a compound that meets the identification criteria but the result is less than the sample quantitation limit but greater than zero.
- B = This flag is used when the analyte is found in the associated blank as well as in the sample. B codes do not necessarily invalidate the data but are dependent upon the judgement of the reviewer in applying the validation guidelines. This flag is used for a TIC as well as for a positively identified target compound list (TCL) compound.
- E = This flag identifies compounds whose concentrations exceed the calibration range of the GC/MS instrument for that specific analysis.
- D = This flag identifies all compounds identified during a re-analysis of a diluted sample.
- A = This flag indicates that a TIC is a suspected aldol-condensation product.



SAMPLE DESCRIPTION INFORMATION for City of St. Louis Park

Lab ID	Client ID	Matrix	Sampled Date Time	Received Date
014223-0001-SA 014223-0002-SA 014223-0003-SA 014223-0004-FB 014223-0006-SA 014223-0006-MS 014223-0006-SD 014223-0007-SA 014223-0008-SA 014223-0009-SA	PCJ-SLP7-032791 PCJ-SLP8-032791 MSH-SLP13-032791 PCJ-SLP6FB-032791 PCJ-SLP6FBD-032791 PCJ-SLP6-032791 PCJ-SLP6MS-032791 PCJ-SLP6MSD-032791 PCJ-SLP6D-032791 IGV-WI05-032791	AQUEOUS	27 MAR 91 27 MAR 91	28 MAR 91 28 MAR 91
014223-0010-SA 014223-0011-SA	MSH-SLP17-032791 MSH-SLP12-032791	AQUEOUS	27 MAR 91 27 MAR 91	28 MAR 91 28 MAR 91



TABLE OF CONTENTS FOR CITY OF ST. LOUIS PARK RMAL PROJECT# 014223

PPT PAH

QC Summary	.001
Sample Data	.015
Standards Data	. 545
Raw OC Data	.971



CHAIN OF	CUSTC	UY					* ****	SAMPLE SA	AFE ^{IM} COND	ITIONS	
ENSECO CLIENT	<i>p T</i>	6	CT / /	an'il	·	PACKED BY	20			SEAL NUMBER	
PROJECT	Lily	05	ST LOUIS P	NRK		SEAL INTACT	UPON RECEIPT	BY SAMPLING COMPANY		CONDITION OF CONTENTS	
SAMPLING COMPANY	,					SEALED FOR	SHIPPING BY	·		INITIAL CONTENTS TEMP	
	SA1	75				242 SEAL NUMBER	34	ISAMPUNG STA			° C
SAMPLING SITE	SAV	4 15				SEAL NUMBER	•	Done		inving Until	
TEAM LEADER						SEAL INTACT	UPON RECEIPT		CONTENTS	TEMPERATURE LPON RECEIPT	
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CHAIN OF	CUST	YUY					SAMPLE SAFE TM CONDITIONS							
PROJECT	C.7	y of	ST LOUIS F	PARK		PACKED BY	202 A	SEAL NUMBER CONDITION OF CONTENTS						
SAMPLING COMPAN		ME	a)			I .	SHIPPING BY			INITIAL CONTENTS TEMP	°C			
SAMPLING SITE	5 A						R UPON RECEIPT E	SAMPLING ST	☐ Contin	uving Until				
TEAM CEACER	24	2 N				Yes			CONTENTO	and devote or of fileding of	°C			
DATE	TIME		SAMPLE ID/DESCRIPTION		SAME	LE TYPE	# CONTAINERS	ANALYSIS PA	RAMETERS	REMARK	S			
3-27-91		RCU-	5LPGFB-0327	9/	126	AMDEK	6			LOW LEVE	1 ppT			
3-27-91	h	peu-	SLPGFBD-032	79/	IXLK	MIDEK	6		•	LOW LEVE	1 PPT			
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CHAIN OF	CUSTO	DY					SAMPLE SAFE ^{IM} CONDITIONS							
ENSECO CLIENT	P.7		· ct / o	u = D	10 V		PACKED BY	1286	· · · · · · · · ·		AFE CONDI	SEAL NUMBER		
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SAMPLING SITE	~	AME					SEAL NUMBE	н	ľ	Done	Continu	ving Until		
TEAM LEADER			• • • • • • • • • • • • • • • • • • • •					UPON RECEIPT					N RECEIPT BY LAB	
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, DATE	TIME	 	SAMPLE ID/DESC	RIPTION		SAME	LE TYPE	# CONTAINERS	ANA	LYSIS PAR	AMETERS	 	REMARKS	
	 	PCU-	SLPGHS -	0327	9/	IXL	AMDED	6	P	OT P	AH	Low	LEVEL	PPT
3-27-9/ 50 5 3-27-9/		PCU-S	LPGMSD -	03-27	-9/	IXL	A M BER	6	رم	OT P	AH	LON L	EUS/ F	PT
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SUMMARY

DATA

PACKAGE

FOR

City of St. Louis Park

DMAL# 14223

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

14223-01

EPA SAMPLE NO.

Lab Name: ENSECO-RMAL Contract No.:

Lab Code: ENSECO Case No.: 14223 SAS No.: SDG No.:

Matrix: (soil/water) WATER Lab Sample ID: 14223-01

Sample wt/vol: 3980 (g/ml) ML Lab File ID: X2968

Level: (low/med) LOW Date Received: 03/28/91

% Moisture: not dec. dec. Date Extracted: 03/31/91

Extraction: (SepF/Cont/Sonc) CONT Date Analyzed: 04/10/91

GPC Cleanup: (Y/N) N pH: 7.0 Dilution Factor: 0.126

CONCENTRATION UNITS: NG/L

CAS NO.	COMPOUND		Q
271-89-6	2,3-Benzofuran	5.1	U
496-11-7	2,3-Dihydroindene	<u> </u>	1
	1H-Indene	1.3	1
91-20-3	Naphthalene	4.8	JB*
4565-32-6	Benzo(B)Thiophene	0.9	ן ט ן
91-22-5	Quinoline	1.4	ן ט ן
120-72-9	1H-Indole	2.5	ן ט
91-57-6	2-Methylnaphthalene		В
90-12-0	1-Methylnaphthalene	1.7	B*
92-52-4	Biphenyl	1.1	J * 1
208-96-8	Acenaphthylene	6.0	
83-32-9	Acenaphthene	12	
132-64-9	Dibenzofuran	1.0	ן ט
86-73-7	Fluorene	1.5	
132-65-0	Dibenzothiophene	_} 1.1	ט
85-01-8	Phenanthrene	1.4	*
120-12-7	Anthracene	1.1	U
260-94-6	Acridine	2.9	U
86-74-8	Carbazole	1.9	U
206-44-0	Fluoranthene	1.1	J
129-00-0	Pyrene	4.0	[[
56-55-3	Benzo(A) Anthracene	2.5	U
218-01-9	Chrysene		ן ט
205-99-2	Benzo(B)Fluoranthene	2.5	U
	Benzo(K) Fluoranthene		ן ט
192-97-2	Benzo(E) Pyrene	1.9	ן ט
50-32-8	Benzo (A) Pyrene	_ 2.3	ט
198-55-0	Perylene	2.5	ן ט
193-39-5	Indeno(1,2,3-CD)Pyrene	2.1	ן ט
53-70-3	Dibenz (A, H) Anthracene	1.6	ן ט
	· · · · · · · · · · · · · · · · · · ·	 ,	

191-24-2----Benzo(G,H,I)Perylene_

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2.8

EPA SAMPLE NO. 1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

14223-04

Contract No.: Lab Name: ENSECO-RMAL

1

Lab Code: ENSECO Case No.: 14223 SAS No.: SDG No.:

Lab Sample ID: 14223-04 Matrix: (soil/water) WATER

Sample wt/vol: 4210 (g/ml) ML Lab File ID: X2971

Date Received: 03/28/91 Level: (low/med) LOW

Date Extracted: 03/31/91 % Moisture: not dec. dec.

Date Analyzed: 04/10/91 Extraction: (SepF/Cont/Sonc) CONT

GPC Cleanup: (Y/N) N pH: 7.0 Dilution Factor: 0.119

CAS NO.	COMPOUND	,	Q
271-89-6	2,3-Benzofuran	4.9	U
496-11-7	2,3-Dihydroindene	1.4	
	1H-Indene	1.0	*
91-20-3	Naphthalene	5.2	JВ
4565-32-6	Benzo(B)Thiophene	0.9	U
91-22-5	Quinoline	1.3	U
120-72-9	1H-Indole	2.4	U
91-57-6	2-Methylnaphthalene	3.5	B*
90-12-0	1-Methvlnaphthalene	1.2	JВ
92-52-4	Biphenyl		υ
208-96-8	Acenaphthylene	1.3	U
83-32-9	Acenaphthene	1.2	U
132-64-9	Dibenzofuran	_ 1.0	Ū
86-73-7	Fluorene	1.0	U
132-65-0	Dibenzothiophene	_ 1.0	ט
85-01-8	Phenanthrene	1.7	
120-12-7	Anthracene	1.0	U
260-94-6	Acridine	2.8	ប
86-74-8	Carbazole	1.8	บ
206-44-0	Fluoranthene	1.2	J *
			U
56-55-3	Pyrene Benzo(A)Anthracene	2.4	U
218-01-9	Chrysene	2.7	U
205-99-2	Benzo(B) Fluoranthene	2.4	U
207-08-9	Benzo(K)Fluoranthene	2.2	U
192-97-2	Benzo(E)Pyrene	1.8	ט
50-32-8	Benzo(A)Pyrene	2.2	บ
198-55-0	Perylene	2.4	U
193-39-5	Perylene Indeno(1,2,3-CD)Pyrene	2.0	U
53-70-3	Dibenz(A,H)Anthracene	_ 1.5	Ū
191-24-2	Benzo(G,H,I)Perylene	2.7	ับ

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

14223-06

Lab Name: ENSECO-RMAL Contract No.:

Lab Code: ENSECO Case No.: 14223 SAS No.: SDG No.:

Lab Sample ID: 14223-06 Matrix: (soil/water) WATER

Sample wt/vol: 4050 (g/ml) ML Lab File ID: X2979

Level: (low/med) LOW Date Received: 03/28/91

% Moisture: not dec. dec. Date Extracted: 04/01/91

Extraction: (SepF/Cont/Sonc) CONT Date Analyzed: 04/11/91

GPC Cleanup: (Y/N) N pH: 7.0 Dilution Factor: 0.123

CAS NO.	COMPOUND	ON UNITS: NG/L	Q
271-89-6	2,3-Benzofuran	5.0	Ū
496-11-7	2,3-Dihydroindene	_	ľ
	1H-Indene	2.8	1
91-20-3	Naphthalene	3.3	JВ
4565-32-6	Benzo(B)Thiophene	1.4	*
91-22-5	Quinoline) ប
120-72-9	1H-Indole	_ 2.5	ט
91-57-6	2-Methylnaphthalene	_ 2.4	В
90-12-0	1-Methylnaphthalene	_{ 1.2	J *
92-52-4	Biphenyl	1.2	J
208-96-8	Biphenyl Acenaphthylene	1.4	ן ט
83-32-9	Acenaphthene	_ 5.1	
132-64-9	Dibenzofuran	1.0	U
	Fluorene	_ 1.0	ן ט
132-65-0	Dibenzothiophene	_ 1.1	ן ט
85-01-8	Phenanthrene	1.2	JB
120-12-7	Anthracene	_	ן ט
260-94-6	Acridine	_ 2.9	U
86-74-8	Carbazole	1.9	ט
206-44-0	Fluoranthene	1.4	ן ט
129-00-0	Pyrene	1.3	JB
56-55-3	Benzo(A)Anthracene	2.5	บ
218-01-9	Chrysene	2.8	U
205-99-2	Benzo(B) Fluoranthene	2.5	ן ט
207-08-9	Benzo(K)Fluoranthene	2.3	ט
192-97-2	Benzo(E)Pyrene	1.9	ซ
1 50-32-8	Benzo(A)Pyrene	(2.3	U
198-55-0	Perylene	2.5	U
193-39-5	Perylene Indeno(1,2,3-CD)Pyrene	2.1	U
53-70-3	Dibenz(A,H)Anthracene	1.6	ט
191-24-2	Benzo(G,H,I)Perylene	2.8	Ū

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SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

14223-07

Lab Name: ENSECO-RMAL Contract No.:

Lab Code: ENSECO Case No.: 14223 SAS No.: SDG No.:

Matrix: (soil/water) WATER Lab Sample ID: 14223-07

Sample wt/vol: 4220 (g/ml) ML Lab File ID: X2985

Level: (low/med) LOW Date Received: 03/28/91

% Moisture: not dec. dec. Date Extracted: 03/31/91

Extraction: (SepF/Cont/Sonc) CONT Date Analyzed: 04/12/91

GPC Cleanup: (Y/N) N pH: 7.0 Dilution Factor: 0.118

CAS NO.	COMPOUND		Q
271-89-6	2,3-Benzofuran	4.8	ש
	2,3-Dihydroindene	32	
	1H-Indene	5.1	
91-20-3	Naphthalene	_ 7.5	В
4565-32-6	Benzo(B)Thiophene	2.6	*
91-22-5	Quinoline	1.3	ט
	1H-Indole	2.4	ן ט ן
91-57-6	2-Methylnaphthalene	_ 7.1	В
90-12-0	1-Methylnaphthalene	<u> </u>	В
92-52-4	Biphenvl	2.1	J
208-96-8	Acenaphthylene	_ 1.3	ן טן
83-32-9	Acenaphthene	_ 1.2	ן טן
132-64-9	Dibenzofuran	0.9	ן ט ן
86-73-7	Fluorene	0.9	ן די
132-65-0	Dibenzothiophene		ן טן
85-01-8	Phenanthrene	1.7	*
120-12-7	Anthracene	_ 1.1	ן טן
260-94-6	Acridine	2.7	ן טן
86-74-8	Carbazole	1.8	ן טן
206-44-0	Fluoranthene	1.2	J
129-00-0	Pyrene	1.1	J
56-55-3	Benzo(A)Anthracene	2.4	ן ט
	Chrysene	4.5	ן טן
205-99-2	Benzo(B) Fluoranthene	2.0	ן ט
207-08-9	Benzo(K) Fluoranthene	2.4	ן ט
192-97-2	Benzo (E) Pyrene	_ 1.8	ן ט
50-32-8	Benzo(A) Pyrene	_ 2.2	ן ט
198-55-0	Pervlene	1 2.4	ן ט
193-39-5	Indeno(1,2,3-CD)Pyrene	2.0	ן טן
53-70-3	Dibenz (A, H) Anthracene	1.5	ן טן
191-24-2	Benzo(G,H,I)Perylene	2.6	ן טן
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SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

1B

14223-06MS

Contract No.: Lab Name: ENSECO-RMAL

Lab Code: ENSECO Case No.: 14223 SAS No.: SDG No.:

Lab Sample ID: 14223-06MS Matrix: (soil/water) WATER

Sample wt/vol: 4050 (g/ml) ML Lab File ID: X2980

Date Received: 03/28/91 Level: (low/med) LOW

% Moisture: not dec. dec. Date Extracted: 04/01/91

Extraction: (SepF/Cont/Sonc) CONT Date Analyzed: 04/11/91

Dilution Factor: 0.123 GPC Cleanup: (Y/N) N pH: 7.0

CAS NO.	COMPOUND	, –	Q
271-89-6	2,3-Benzofuran	5.0	Ū
496-11-7	2,3-Dihydroindene		
95-13-6	1H-Indene	13	SP
91-20-3	Naphthalene	_ 11	B*SP
4565-32-6	Benzo(B)Thiophene	_ 2.5	
91-22-5	Quinoline	10	SP
120-72-9	1H-Indole	2.5	ט
91-57-6	2-Methylnaphthalene	12	B SP
90-12-0	1-Methylnaphthalene	1.7	*
92-52-4	Biphenyl Acenaphthylene	1.9	ÌЈ
208-96-8	Acenaphthylene	1.6	* .
83-32-9	Acenaphthene	_ 10	
132-64-9	Dibenzofuran	_ 1.0	ן ט
86-73-7	Fluorene	10	SP
132-65-0	Dibenzothiophene	_ 1.1	U
85-01-8	Phenanthrene	1.8	B*
120-12-7	Anthracene	1.1	ן ט
260-94-6	Acridine	2.9	Ŭ
86-74-8	Carbazole	_ 1.9	U
206-44-0	Fluoranthene	1.4	
129-00-0	Pyrene	2.2	В
56-55-3	Benzo(A)Anthracene	2.5	U
218-01-9	Chrysene	4.2	SP
205-99-2	Benzo(B) Fluoranthene	2.5	ט
	Benzo(K) Fluoranthene	2.3	ט
192-97-2	Benzo(E)Pyrene	_ 2.3	SP
50-32-8	Benzo(A)Pyrene	2.3	ן ט
198-55-0	Perylene	2.5	ט
193-39-5	Perylene Indeno(1,2,3-CD)Pyrene	2.1	บ
53-70-3	Dibenz(A,H)Anthracene	1.6	ט
191-24-2	Benzo(G,H,I)Perylene	2.8	ט

1B SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

14223-06MSD

Lab Name: ENSECO-RMAL Contract No.:

Lab Code: ENSECO Case No.: 14223 SAS No.: SDG No.:

Matrix: (soil/water) WATER Lab Sample ID: 14223-06MSD

Sample wt/vol: 4200 (g/ml) ML Lab File ID: X2986

Level: (low/med) LOW Date Received: 03/28/91

% Moisture: not dec. dec. Date Extracted: 04/01/91

Extraction: (SepF/Cont/Sonc) CONT Date Analyzed: 04/12/91

GPC Cleanup: (Y/N) N pH: 7.0 Dilution Factor: 0.119

CAS NO.	COMPOUND	·	Q
271-89-6	2,3-Benzofuran	4.9	Ū
	2,3-Dihydroindene	28	
	1H-Indene		SP
91-20-3	Naphthalene	9.7	B SP
4565-32-6	Benzo(B)Thiophene	2.3	*
91-22-5	Quinoline	9.4	SP
120-72-9	1H-Indole		U
91-57-6	2-Methylnaphthalene	_ 11	B SP
90-12-0	1-Methylnaphthalene	1.6	*
92-52-4	Biphenyl		J
208-96-8	Acenaphthylene	1.4	
83-32-9	Acenaphthene	9.3	
132-64-9	Dibenzofuran	1.0	บ
86-73-7	Fluorene	9.0	SP
132-65-0	Dibenzothiophene	1.0	ט
85-01-8	Phenanthrene	1.3	B*
120-12-7	Anthracene	1.0	ָ ע
260-94-6	Acridine_	2.8	U
86-74-8	Carbazole	1.8	ט
206-44-0	Fluoranthene	1.2	J
129-00-0	Pyrene	1.8	В
56-55-3	Pyrene Benzo(A)Anthracene	2.4	ט
218-01-9	Chrysene Benzo(B)Fluoranthene	3.1	SP
205-99-2	Benzo(B) Fluoranthene	_ _{2.4}	ן ט
207-08-9	Benzo(K)Fluoranthene	_ 2.2	ן ט
192-97-2	Benzo(E) Pyrene	1.4	J SP
50-32-8	Benzo(A) Pyrene		U
198-55-0	Perylène	2.4	ט
193-39-5	Perylene	_ 2.0	Ū
53-70-3	Dibenz (A, H) Anthracene	1.5	ן ט
191-24-2	Benzo(G,H,I)Perylene	2.7	บ
			l

2C
WATER SEMIVOLATILE SURROGATE RECOVERY

Lab Name: RMAL Contract:

Lab Code: ENSECO Case No.: 14223 SAS No.: SDG No.:

Level: LOW

:	EPA SAMPLE NO.	S1 (NAP) #	S2 (FLU) #	S3 (CHR) #
1	14223-01	96	120	40
2	14223-02	95	120	42
3	14223-03	98	125	47
4	14223-04	104	129	69
5	14223-06	50	55	20
6	14223-07	96	101	46
7	14223-09	54	60	23
8	14223-10	102	127	47
9	14223-11	84	101	41
10	14223-06MS	88	112	53
11	14223-06MSD	83	98	39
12	BLK01	91	112	71
13	BLK02	81	98	66
		_		l

			QC LIMITS
S1	(NAP)	= D8-NAPHTHALENE	(14-108)
S2	(FLU)	= D10-FLUORENE	(41-162)
S3	(CHR)	= D12-CHRYSENE	(10-118)

- # Column to be used to flag recovery values
- * Values outside of contract required QC limits
- D Surrogates diluted out

2C
WATER SEMIVOLATILE SURROGATE RECOVERY

Lab Name: RMAL Contract:

Lab Code: ENSECO Case No.: 14223 SAS No.: SDG No.:

Level: MED

	EPA	S1	S2	S3
	SAMPLE NO.	(NAP) #	(FLU) #	(CHR) #
1 2	14223-08	95	106	76
	BLK03	105	124	88

				QC.LIMITS
S1	(NAP)	=	D8-NAPHTHALENE	(14-108)
S2	(FLU)	=	D10-FLUORENE	(41-162)
S3	(CHR)	=	D12-CHRYSENE	(10-118)

- # Column to be used to flag recovery values
- * Values outside of contract required QC limits
- D Surrogates diluted out

3C
WATER SEMIVOLATILE MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERY

Lab Name: RMAL Contract:

Lab Code: ENSECO Case No.: 14223 SAS No.: SDG No.:

Matrix Spike - EPA Sample No.: 14223-06 LEVEL: LOW

Compound	SPIKE	SAMPLE	MS	MS
	ADDED	CONCENTRATION	CONCENTRATION	%
	(ng/L)	(ng/L)	(ng/L)	REC
1H-Indene Naphthalene Quinoline 2-Methylnaphthalene Fluorene Chrysene Benzo(E) Pyrene	9.84 9.84 9.84 9.84 9.84 9.84	3.77 0 0 2.25 0 0	12.5 10.8 10.0 12.4 10.3 4.17 2.33	99 110 102 103 105 42 24

Compound	SPIKE ADDED (ng/L)	MSD CONCENTRATION (ng/L)	MSD % REC	ዩ RPD
1H-Indene	9.52 9.52 9.52 9.52 9.52 9.52	11.3 9.71 9.41 10.7 9.02 3.08 1.42	90 102 99 89 95 32 15	10 8 3 15 13 27 46

Comments:

4B SEMIVOLATILE METHOD BLANK SUMMARY

Lab Name: RMAL Contract:

Lab Code: ENSECO Case No.: 14223 SAS No.: SDG No.:

Lab File ID: X2965 Lab Sample ID: BLK01

Date Extracted: 03/31/91 Extraction: (SepF/Cont/Sonc) CONT

Date Analyzed: 04/10/91 Time Analyzed: 1431

Matrix: (soil/water) WATER Level: (low/med) LOW

Instrument ID: 4500-X

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS AND MSD:

	EPA	LAB	LAB	DATE
	SAMPLE NO.,	SAMPLE ID	FILE ID	ANALYZED
1 2 3 4 5 6 7 8	14223-01 14223-02 14223-03 14223-04 14223-07 14223-09 14223-10 14223-11	14223-01 14223-02 14223-03 14223-04 14223-07 14223-09 14223-10	X2968 X2969 X2970 X2971 X2985 X2974 X2975 X2976	04/10/91 04/10/91 04/10/91 04/10/91 04/10/91 04/10/91 04/10/91

COMMENTS:

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

BLK01

Lab Name: ENSECO-RMAL Contract No.:

Lab Code: ENSECO Case No.: 14223 SAS No.: SDG No.:

Matrix: (soil/water) WATER Lab Sample ID: BLK01

Sample wt/vol: 4000 (g/ml) ML Lab File ID: X2965

Level: (low/med) LOW Date Received:

% Moisture: not dec. dec. Date Extracted: 03/31/91

Extraction: (SepF/Cont/Sonc) CONT Date Analyzed: 04/10/91

GPC Cleanup: (Y/N) N pH: 7.0 Dilution Factor: 0.125

CAS NO.	COMPOUND		Q
271-89-6	2,3-Benzofuran	5.1	บ
496-11-7	2,3-Dihydroindene	1.4	ן מ
	1H-Indene	0.9	ט
91-20-3	Naphthalene	3.9	J
4565-32-6	Benzo(B)Thiophene	0.9	ט
	Quinoline	1.4	ט
	1H-Indole	2.5	U
91-57-6	2-Methylnaphthalene	3.1	ł
90-12-0	1-Methylnaphthalene	1.5	J
	Biphenyl	4.3	ן ט
	Acenaphthylene	1.4	ט
	Acenaphthene	1.3	ט
	Dibenzofuran	1.0	ן ט
	Fluorene	1.0	ט
	Dibenzothiophene	1.1	ן ט
	Phenanthrene	1.3	ַ ט
	Anthracene	1.1	ַ ע
	Acridine	2.9	ט
	Carbazole	1.9	ט
	Fluoranthene	1.4	ט
129-00-0		1.4	U
56-55-3	Benzo(A)Anthracene	2.5	U
	Chrysene	2.8	ן ט
205-99-2	Benzo(B) Fluoranthene	2.5	ן ט
207-08-9	Benzo(K)Fluoranthene	2.3	U
192-97-2	Benzo(E) Pyrene	1.9	υ
50-32-8	Benzo(A) Pyrene	2.3	ע ו
198-55-0	Perylene	2.5	U
	Indeno(1,2,3-CD)Pyrene	2.1	ט
53-70-3	Dibenz(A,H)Anthracene	1.6	U
191-24-2	Benzo(G,H,I)Perylene	2.8	ט

4B SEMIVOLATILE METHOD BLANK SUMMARY

Lab Name: RMAL Contract:

Lab Code: ENSECO Case No.: 14223 SAS No.: SDG No.:

Lab File ID: X2966 Lab Sample ID: BLK02

Date Extracted: 04/01/91 Extraction: (SepF/Cont/Sonc) CONT

Date Analyzed: 04/10/91 Time Analyzed: 1516

Matrix: (soil/water) WATER Level: (low/med) LOW

Instrument ID: 4500-X

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS AND MSD:

	EPA	LAB	LAB	DATE
	SAMPLE NO.	SAMPLE ID	FILE ID	ANALYZED
1	14223-06	14223-06	X2979	04/11/91
2	14223-06MS	14223-06MS	X2980	04/11/91
3	14223-06MSD	14223-06MSD	X2986	04/12/91

COMMENTS:

EPA SAMPLE NO.

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

BLK02

Lab Name: ENSECO-RMAL Contract No.:

Lab Code: ENSECO Case No.: 14223 SAS No.: SDG No.:

Lab Sample ID: BLK02 Matrix: (soil/water) WATER

Lab File ID: X2966 Sample wt/vol: 4000 (g/ml) ML

Level: (low/med) LOW Date Received:

dec. Date Extracted: 04/01/91 % Moisture: not dec.

Extraction: (SepF/Cont/Sonc) CONT Date Analyzed: 04/10/91

Dilution Factor: 0.125 GPC Cleanup: (Y/N) N pH: 7.0

CONCENTRATION UNITS: NG/L

CAS	NO.	COMPOUND					Q
271-	-89-6	-2,3-Benzofuran		5.	1	Ū	
496-	-11-7	-2,3-Dihydroinde	ne	1.	4	U	
95-	-13-6	-1H-Indene		0.	. 9	U	
91-	-20-3	-Naphthalene			. 5] J	*
4565-	-32-6	-Benzo(B)Thiophe	ne	0.	. 9	U	
91-	-22-5	-Quinoline		1.	. 4	U	
l 120-	-72-9	-1H-Indole	-	2.	. 5	ַ ד	
91-	-57-6	-2-Methylnaphtha	lene	2.	. 5		*
l 90-	-12-0	-1-Methvlnaphtha	lene	1.	_	U	
92-	-52-4	Biphenyl		4.	. 3	U	
208-	-96-8	-Acenaphthylene_		1.	_	U	
83-	-32-9	-Acenaphthene		1.	. 3	ן ט	
132-	-64-9	-Dibenzofuran		1.	. 0	ן ט	
86-	-73-7	-Fluorene		1.	. 0	U	
132-	-65-0	-Dibenzothiophene	e	1.	. 1	ע	
85-	-01-8	-Phenanthrene		1.	_	J	
120-	-12-7	-Anthracene		1.	_	U	
260-	-94-6	-Acridine		2.	. 9	U	
86-	-74-8	-Carbazole		1.	9	U	
206-	-44-0	-Fluoranthene		1.	4	U	
129-	-00-0	-Pyrene		1.		U	
56-	-55-3	Benzo(A)Anthrace	ene	2.	. 5	U	
218-	-01-9	-Chrysene		2.	8	ט	
205-	-99-2	Benzo(B) Fluorant	thene	2.	.5	U	
207-	-08-9	Benzo(K) Fluorant	thene	2.	3	U	
192-	-97-2	Benzo (E) Pyrene		1.	9	U	
50-	-32-8	-Benzo(A)Pvrene		2.	3	U	
198-	-55-0	Perylene Indeno(1,2,3-CD)		2.	5	U	
193-	-39-5	Indeno(1,2,3-CD)	Pyrene	2.	1	U	
53-	-70 - 3 	-Dibenz (A,H) Anthı	racene	1.	6	บ	
191-	-24-2	Benzo(G,H,I)Pery	ylene	2.	8	U	_

4B SEMIVOLATILE METHOD BLANK SUMMARY

Lab Name: RMAL Contract:

Lab Code: ENSECO Case No.: 14223 SAS No.: SDG No.:

Lab File ID: X29467 Lab Sample ID: BLK03

Date Extracted: 04/01/91 Extraction: (SepF/Cont/Sonc) CONT

Date Analyzed: 04/10/91 Time Analyzed: 1601

Matrix: (soil/water) WATER Level: (low/med) MED

Instrument ID: 4500-X

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS AND MSD:

	EPA	LAB	LAB	DATE
	SAMPLE NO.	SAMPLE ID	FILE ID	ANALYZED
1	14223-08	14223-08	X2982	04/11/91

COMMENTS:

1 R

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

BLK03

Lab Name: ENSECO-RMAL Contract No.:

Lab Code: ENSECO Case No.: 14223 SAS No.: SDG No.:

Matrix: (soil/water) WATER Lab Sample ID: BLK03

Sample wt/vol: 500 (g/ml) ML Lab File ID: X2967

Level: (low/med) MED Date Received:

% Moisture: not dec. dec. Date Extracted: 04/01/91

Extraction: (SepF/Cont/Sonc) CONT Date Analyzed: 04/10/91

GPC Cleanup: (Y/N) N pH: 7.0 Dilution Factor: 10.0

CONCENTRATION UNITS: NG/L

CAS NO.	COMPOUND		Q
271-89-6	2,3-Benzofuran	410	U
496-11-7	2,3-Dihydroindene	110	U
	1H-Indene	72	U
	Naphthalene	520	U
	Benzo(B)Thiophene		ן ע
	Quinoline	110	ט
	1H-Indole	200	ן ד
	2-Methylnaphthalene		ן ט
	1-Methylnaphthalene	<u> </u>	U
	Biphenyl	340	ן ט
208-96-8	Acenaphthylene	110	ן ט
	Acenaphthene	<u> </u>	ן ט
	Dibenzofuran	80	טן
	Fluorene	80	ט
132-65-0	Dibenzothiophene	88	ប
85-01-8	Phenanthrene	100	U
	Anthracene	<u> </u>	U
	Acridine	230	ן ט
	Carbazole	150	ן ט
	Fluoranthene	110	ן ט
129-00-0	Pyrene	<u> </u>	ן ד
	Benzo(A)Anthracene	200	ט
	Chrysene		ן ט
205-99-2	Benzo(B) Fluoranthene		U .
207-08-9	Benzo(K) Fluoranthene	180	ן ט
192-97-2	Benzo(E)Pyrene	150	U
50-32-8	Benzo(A) Pyrene	180	U
198-55-0	Perylene	200	ט
193-39-5	Indeno(1,2,3-CD)Pyrene		ן ט
53-70-3	Dibenz (A, H) Anthracene	<u> </u>	ן ט
	Benzo(G,H,I)Perylene	220	ט

Lab Name: RMAL

Contract No:

Lab Code: ENSECO Case No: 14223 SAS No: SDG No:

SAMPLE ID	LAB FILE ID	DATE OF ANALYSIS	TIME OF ANALYSIS
40 PPB_PAH_STD 20 PPB_PAH_STD 4800 PPB_PAH_STD 1200 PPB_PAH_STD 240 PPB_PAH_STD	X2940	03/25/91	1439
	X2941	03/25/91	2100
	X2944	03/25/91	2314
	X2943	03/25/91	2229
	X2942	03/25/91	2145

Lab Name: RMAL Contract No:

Lab Code: ENSECO Case No: 14223 SAS No: SDG No:

SAMPLE ID	LAB FILE ID	DATE OF ANALYSIS	TIME OF ANALYSIS
40 PPB PAH STD	X2964	04/10/91	1241
BLK01	X2865	04/10/91	1431
BLK02	X2966	04/10/91	1516
BLK03	X2967	04/10/91	1601
14223-01	X2968	04/10/91	1645
14223-02	X2969	04/10/91	1730
14223-03	X2970	04/10/91	1815
14223-04	X2971	04/10/91	1900
14223-09	X2974	04/10/91	2115
14223-10	X2975	04/10/91	2159
14223-11	X2976	04/10/91	2244

Lab Name: RMAL

Contract No:

Lab Code: ENSECO Case No: 14223 SAS No: SDG No:

SAMPLE ID	LAB FILE ID	DATE OF ANALYSIS	TIME OF ANALYSIS
40 PPB_PAH_STD	X2978	04/11/91	1241
14223-06	X2879	04/11/91	1812
14223-06MS	X2980	04/11/91	1857
14223-08	X2982	04/11/91	2026

Lab Name: RMAL

Contract No:

Lab Code: ENSECO Case No: 14223 SAS No: SDG No:

SAMPLE ID	LAB FILE ID	DATE OF ANALYSIS	TIME OF ANALYSIS
40 PPB_PAH_STD	X2984	04/12/91	1304
14223-07	X2985	04/12/91	1502
14223-06MSD	X2986	04/12/91	1547

INITIAL CALIBRATION DATA PAH COMPOUNDS

Lab Name: RMAL Lab Code: ENSECO Case No: 14223

Instrument ID: 4500-X Calibration Date(s): 03/25/91

Maximum % RSD is 35%

Lab File ID: RRF 240= X2942	RRF RRF 12	20= X294 200= X294		RRF RRF 4	40= X29 1800= X29		
COMPOUND	20 PPB RRF	40 PPB RRF	240PPB RRF	1200PPB RRF	4800PPB RRF	AVE RRF	%RSD
2,3-Benzofuran	0.932	0.934	0.887	0.921	0.926	0.920	2.1
2,3-Dihydroindene	0.726	0.781	0.762	0.802	0.805	0.775	4.2
1H-Indene	0.743	0.817	0.739	0.788	0.794	0.776	4.4
Naphthalene	1.722	1.639	1.730	1.794	1.817	1.740	4.0
Benzo(B)Thiophene	1.342	1.230	1.277	1.319	1.330	1.300	3.5
Quinoline	0.592	0.740	0.815	0.961	1.029	0.827	
1H-Indole	0.820	0.788	0.928	1.029	1.074	0.928	-
2-Methylnaphthalene	0.673	0.766	0.753	0.783	0.795	0.756	6.5
1-Methylnaphthalene	0.727	0.800	0.814	0.849	0.858	0.810	6.4
Biphenyl	1.060	1.117	1.201	1.263	1.273	1.183	7.8
Acenaphthylene	1.280	1.387	1.493	1.714	1.796	1.534	14.2
Acenaphthene	1.004	0.998	1.052	1.117	1.115	1.057	5.5
Dibenzofuran	1.257	1.271	1.399	1.466	1.488	1.376	7.8
Fluorene	1.039	1.089	1.150	1.223	1.248	1.150	7.7
Dibenzothiophene	0.837	0.810	0.815	0.861	0.802	0.825	2.9
Phenanthrene	0.835	0.880	0.888	0.940	0.885	0.886	4.2
Anthracene	0.669	0.787	0.849	0.949	0.913	0.833	
Acridine	0.320	0.442	0.529	0.692	0.685	0.534	29.9
Carbazole	0.645	0.618	0.703	0.787	0.754	0.701	10.1
Fluoranthene	0.930	1.016	0.984	1.079	1.020	1.006	5.4
Pyrene	1.238	1.180	1.050	1.102	1.044	1.123	7.5
Benzo (A) Anthracene	1.038	1.130	1.248	1.222	1.135	1.155	7.2
Chrysene	1.414	1.388	1.354	1.245	1.132	1.307	8.9
Benzo (B) Fluoranthene	1.029	1.039	1.054	1.060	1.053	1.047	1.2
Benzo(K) Fluoranthene	1.543	1.271	1.598	1.356	1.346	1.423	9.8
Benzo (E) Pyrene	1.088	1.152	1.075	1.033	0.968	1.063	6.4
Benzo(A) Pyrene	0.930	1.027	1.052	1.077	1.016	1.020	5.5
Perylene	0.729	0.740	0.809	0.467	0.830	0.715	20.3
Indeno(1,2,3-CD)Pyrene	1.289	1.158	1.156	1.222	1.154	1.196	5.0
Dibenz (A, H) Anthracene	1.040	1.021	1.056	1.060	1.020	1.039	1.8
Benzo(G,H,I)Perylene	1.068	1.067	1.118	1.084	1.026	1.073	3.1
D8-Naphthalene	1.530	1.508	1.569	1.622	1.661	1.578	4.0
D10-Flourene	0.860	0.863	0.931	1.000	1.024	0.936	8.1
D12-Chrysene	1.410	1.193	1.139	1.029	0.944	1.143	15.6

CONTINUING CALIBRATION DATA PAH COMPOUNDS

Tab Name: RMAL Lab Code: ENSECO Case No: 14223

Instrument ID: 4500-X Calibration Date(s): 04/10/91 Time: 1241

Lab ID: X2964 Initial Calibration Date: 03/25/91

Maximum %D is 35%

COMPOUND	INITIAL AVE RRF	40 PPB RRF	%D
2,3-Benzofuran	0.920	0.954	-3.7
2,3-Dihydroindene	0.775	0.825	-6.5
1H-Indene	0.776	0.756	2.6
Naphthalene	1.740	1.729	0.6
Benzo(B) Thiophene	1.300	1.265	2.7
Quinoline	0.827	0.635	23.2
1H-Indole	0.928	0.747	19.5
2-Methylnaphthalene	0.756	0.722	4.5
1-Methylnaphthalene	0.810	0.810	0.0
Biphenyl	1.183	1.221	-3.2
Acenaphthylene	1.534	1.298	15.4
Acenaphthene	1.057	1.021	3.4
Dibenzofuran	1.376	1.272	7.6
Fluorene	1.150	1.065	7.4
Dibenzothiophene	0.825	0.807	2.2
Phenanthrene	0.886	0.908	-2.5
Anthracene	0.833	0.722	13.3
Acridine	0.534	0.368	31.1
Carbazole	0.701	0.626	10.7
Fluoranthene	1.006	0.944	6.2
Pyrene	1.123	1.124	-0.1
Benzo(A) Anthracene	1.155	1.102	4.6
Chrysene	1.307	1.737	-32.3
Benzo(B) Fluoranthene	1.047	1.372	-31.0
Benzo (K) Fluoranthene	1.423	1.430	-0.5
Benzo(E) Pyrene	1.063	1.391	-30.9
Benzo (A) Pyrene	1.020	1.085	-6.4
Perylene	0.715	0.791	-10.6
Indeno(1,2,3-CD) Pyrene	1.196	0.979	18.1
Dibenz (A, H) Anthracene	1.039	0.957	7.9
Benzo(G,H,I)Perylene	1.073	1.108	-3.3
D8-Naphthalene	1.578	1.594	-1.0
D10-Flourene	0.936	0.849	9.3
D12-Chrysene	1.143	1.371	-19.9

CONTINUING CALIBRATION DATA PAH COMPOUNDS

Lab Name: RMAL Lab Code: ENSECO Case No: 14223

Instrument ID: 4500-X Calibration Date(s): 04/11/91 Time: 1505

Lab ID: X2978 Initial Calibration Date: 03/25/91

Maximum %D is 35%

COMPOUND	INITIAL AVE RRF	40 PPB RRF	%D
2,3-Benzofuran	0.920	1.145	-24.5
2,3-Dihydroindene	0.775	0.779	-0.5
1H-Indene	0.776	0.756	2.6
Naphthalene	1.740	1.733	0.4
Benzo(B)Thiophene	1.300	1.252	3.7
Quinoline	0.827	0.749	9.4
1H-Indole	0.928	0.862	7.1
2-Methylnaphthalene	0.756	0.698	7.7
1-Methylnaphthalene	0.810	0.821	-1.4
Biphenyl	1.183	1.178	0.4
Acenaphthylene	1.534	1.538	-0.3
Acenaphthene	1.057	1.075	-1.7
Dibenzofuran	1.376	1.380	-0.3
Fluorene	1.150	1.129	1.8
Dibenzothiophene	0.825	0.842	-2.1
Phenanthrene	0.886	0.913	-3.0
Anthracene	0.833	0.871	-4.6
Acridine	0.534	0.409	23.4
Carbazole	0.701	0.719	-2.6
Fluoranthene	1.006	1.043	-3.7
Pyrene	1.123	1.148	-2.2
Benzo(A)Anthracene	1.155	1.041	9.9
Chrysene	1.307	1.208	7.6
Benzo(B) Fluoranthene	1.047	1.987	5.7
Benzo(K) Fluoranthene	1.423	1.251	12.1
Benzo (E) Pyrene	1.063	1.003	5.6
Benzo(A) Pyrene	1.020	1.989	3.0
Perylene	0.715	0.771	-7.8
Indeno(1,2,3-CD)Pyrene	1.196	1.085	9.3
Dibenz (A, H) Anthracene	1.039	1.000	3.8
Benzo(G,H,I)Perylene	1.073	1.997	7.1
D8-Naphthalene	1.578	1.603	-1.6
D10-Flourene	0.936	0.936	0.0
D12-Chrysene	1.143	1.011	11.5

FORM VII

CONTINUING CALIBRATION DATA PAH COMPOUNDS

Lab Name: RMAL Lab Code: ENSECO Case No: 14223

Instrument ID: 4500-X Calibration Date(s): 04/12/91 Time: 1304

Lab ID: X2984 Initial Calibration Date: 03/25/91

Maximum %D is 35%

COMPOUND	INITIAL AVE RRF	40 PPB RRF	%D
2,3-Benzofuran	0.920	1.032	-12.2
2,3-Dihydroindene	0.775	0.762	1.7
1H-Indene	0.776	0.751	3.2
Naphthalene	1.740	1.799	-3.4
Benzo(B)Thiophene	1.300	1.290	0.8
Quinoline	0.827	0.743	10.2
1H-Indole	0.928	0.854	8.0
2-Methylnaphthalene	0.756	0.733	3.0
1-Methylnaphthalene	0.810	0.803	0.9
Biphenyl	1.183	1.211	-2.4
Acenaphthylene	1.534	1.661	-8.3
Acenaphthene	1.057	1.011	4.4
Dibenzofuran	1.376	1.413	-2.7
Fluorene	1.150	1.158	-0.7
Dibenzothiophene	0.825	0.820	0.6
Phenanthrene	0.886	0.905	-2.1
Anthracene	0.833	0.817	1.9
Acridine	0.534	0.419	21.5
Carbazole	0.701	0.628	10.4
Fluoranthene	1.006	1.011	-0.5
Pyrene	1.123	1.164	-3.7
Benzo(A) Anthracene	1.155	1.008	12.7
Chrysene	1.307	1.170	10.5
Benzo(B) Fluoranthene	1.047	1.978	6.6
Benzo(K) Fluoranthene	1.423	1.150	19.2
Benzo(E) Pyrene	1.063	0.986	7.2
Benzo(A) Pyrene	1.020	1.991	2.8
Perylene	0.715	0.758	-6.0
Indeno(1,2,3-CD)Pyrene	1.196	1.112	7.0
Dibenz (A, H) Anthracene	1.039	0.988	4.9
Benzo(G,H,I)Perylene	1.073	1.075	-0.2
D8-Naphthalene	1.578	1.606	-1.8
D10-Flourene	0.936	0.915	2.2
D12-Chrysene	1.143	0.991	13.3

8C SEMIVOLATILE INTERNAL STANDARD AREA SUMMARY

Lab Name: RMAL Contract:

Lab Code: ENSECO Case No: 14223 SAS No.: SDG No:

Lab File ID (Standard): X2964 Date Analyzed: 04/10/91

Instrument ID: 4500-X Time Analyzed: 1241

	IS#1 (ACN) AREA #	IS#2 (PHN) AREA #	IS#3 (BAP) AREA #
12 HOUR STD	108000	182000	89200
UPPER LIMIT	216000	364000	178000
LOWER LIMIT	54000	91000	44600
SAMPLE NO.			
14223-01 14223-02 14223-03 14223-04 14223-09 14223-10 14223-11	117000 108000 100000 86200 88400 75400 78700	200000 183000 182000 150000 152000 135000 144000	158000 141000 138000 123000 123000 111000
BLK01 BLK02 BLK03	99900 134000 126000	182000 240000 216000	115000 159000 133000

IS#1 (ACN) = D10-ACENAPHTHENE UPPER LIMIT = + 100%
IS#2 (PHN) = D10-PHENANTHRENE of internal standard area
IS#3 (BAP) = D12-BENZO(A) PYRENE LOWER LIMIT = - 50%
of internal standard area

Column used to flag internal standard area values with an asterisk

8C SEMIVOLATILE INTERNAL STANDARD AREA SUMMARY

Lab Name: RMAL Contract:

Lab Code: ENSECO Case No: 14223 SAS No.: SDG No:

Lab File ID (Standard): X2978 Date Analyzed: 04/11/91

Instrument ID: 4500-X Time Analyzed: 1505

	IS#1 (ACN) AREA #	IS#2 (PHN) AREA #	IS#3 (BAP) AREA #
12 HOUR STD	123000	215000	152000
UPPER LIMIT	246000	430000	304000
LOWER LIMIT	61500	108000	76000
SAMPLE NO.			
14223-06 14223-06MS 14223-08	129000 126000 112000	237000 230000 213000	180000 184000 174000

IS#1 (ACN) = D10-ACENAPHTHENE UPPER LIMIT = + 100%
IS#2 (PHN) = D10-PHENANTHRENE of internal standard area
IS#3 (BAP) = D12-BENZO(A) PYRENE LOWER LIMIT = - 50%

of internal standard area

Column used to flag internal standard area values with an asterisk

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8C SEMIVOLATILE INTERNAL STANDARD AREA SUMMARY

Lab Name: RMAL Contract:

Lab Code: ENSECO Case No: 14223 SAS No.: SDG No:

Lab File ID (Standard): X2984 Date Analyzed: 04/12/91 ·

Instrument ID: 4500-X Time Analyzed: 1304

	IS#1 (ACN) AREA #	IS#2 (PHN) AREA #	IS#3 (BAP) AREA #
		i	
12 HOUR STD	98900	182000	130000 .
		========	=======
UPPER LIMIT	198000	364000	260000
	*=========		==========
LOWER LIMIT	49400	91000	65000
	2========	========	========
SAMPLE NO.			
========	========		=======================================
14223-06SD	114000	211000	174000
14223-07	112000	213000	174000
ŀ			<u> </u>

IS#1 (ACN) = D10-ACENAPHTHENE IS#2 (PHN) = D10-PHENANTHRENE UPPER LIMIT = + 100%

of internal standard area

IS#3 (BAP) = D12-BENZO(A) PYRENE LOWER LIMIT = - 50%

of internal standard area

Column used to flag internal standard area values with an asterisk

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1/87 Rev.

RAP SECTION 7.3(C) MONITORING

2ND QUARTER - 1991



CASE NARRATIVE

for

City of St. Louis Park

July 15, 1991

Enseco - RMAL Project Number 015570

Introduction

Six aqueous samples (including MS and MSD) were received at Enseco-Rocky Mountain Analytical Laboratory on June 26, 1991. The samples were logged in under RMAL project number 015570. Sample SLP6FBD-062591 (RMAL# 015770-04) was extracted and held as per the QAPP. A cross reference associating the RMAL sample numbers to the actual field sample numbers is included. The samples were analyzed for low level part-per-trillion (ppt) polynuclear aromatic hydrocarbons (PAH).

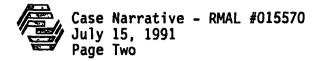
Data Quality Assessment

The results contained in this report were reviewed relative to data acceptance criteria as specified in the 1989 QAPP for completeness, precision, accuracy, representativeness and defensibility of the data. Unless otherwise stated below, no quality control problems or technical difficulties were encountered which would impact the interpretation or use of data in this report.

PPT PAH

All samples show target compounds that do not meet secondary ion confirmation. In some instances a compound that does not meet secondary ion confirmation criteria may still be determined to be present in the sample after close inspection of the data by the analyst. Supportive data includes mass chromatograms maxima at the same scan for primary and secondary ions, as well as discernible quantitation interference with the secondary ion. These compounds are flagged with the asterisk (*) on the data sheets (Form I) as per the 1989 QAPP.

During the original extraction of sample 015770-01MSD the spiking compounds were inadvertently omitted, therefore, the sample required reextraction. The reextraction took place outside holding times.



This data package is in compliance with the terms and conditions of the 1989 QAPP, both technically and for completeness, for other than the conditions detailed above.

Reported by:

4_

Date: 07-15-91

Tracy Compy
Data Control Supervisor

Approved by:

Joel E. Holtz

Program Administrator



SAMPLE DESCRIPTION INFORMATION for City of St. Louis Park

Lab ID	Client ID	Matrix	Sampled Date Time	Received Date
015570-0001-SA	SLP6-062591	AQUEOUS AQUEOUS AQUEOUS AQUEOUS AQUEOUS AQUEOUS	25 JUN 91	26 JUN 91
015570-0001-MS	SLP6MS-062591		25 JUN 91	26 JUN 91
015570-0001-SD	SLP6SD-062591		25 JUN 91	26 JUN 91
015570-0002-SA	SLP6D-062591		25 JUN 91	26 JUN 91
015570-0003-SA	SLP6FB-062591		25 JUN 91	26 JUN 91
015570-0004-SA	SLP6FBD-062591		25 JUN 91	26 JUN 91



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PPT-PAH

QC Summary	001
Sample Data	010
Standards Data)177
Raw OC Data)557



Rocky Mountain Analytical Laboratory 4955 Yarrow Street , Arvada, CO 80002

303/421-6611 FAX: 303/431-7171

CHAIN O	F CUSTO	DY		•	, Com	e comb					03/431-/1/1	
ENSECO CLIENT						SAMPLE SAFE ^{IM} CONDITIONS PACKED BY SEAL NUMBER						
	TUOF	57	LOUIS PARK			743	2.4				SEAL NUMBER	
PROJECT	,					SEAL INTACT	UPON RECEIPT B	Y SAMPLIN	COMPANY		CONDITION OF C	ONTENTS
						<u> </u>					٤	
SAMPLING COMPA		~				SEALED FOR					INITIAL CONTENT	°C '
SAMPLING SITE	SAM	<i>E</i>				SEAL NUMBE	23/		SAMPLING STAT	118		
Draw Line Dire	SAM	E				JOEAL WOME	•		Done		nuing Until	
TEAM LEADER							UPON RECEIPT E	Y LAB			EMPERATURE LPON	
	2921	N		14		Yes		No		1		°C
DATE	TIME		SAMPLE ID/DESCRIPTION	157	SAM	PLE TYPE	# CONTAINERS	AN/	LYSIS PARA	METERS		REMARKS
6-25-91		SLP	-062591	<u>'o'</u>	IXL	AMBER	6	P	ot P	94		
6-25-91		SLPG	MD-062591	02	IXL A	PMBER	6	PF	T PA	4		
6-25-91		SLPG	M5-062591	0/25	IXL A	MOER	6	PP	PAH	, 		
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	•	CUSTODY TR	ANSFERS PRIOR TO SHIPPING			T			SHIPP	ING DETAIL	S	- }
RELINQU	IISHED BY (SIG	NED)	RECEIVED BY (SIGNED)	DATE	TIME	1 24	O SHIPPER BY					7
						METHOD OF	SHIPMENT DR LAB	າ		`	AIRBILL NUMBER	
							AAL		SIGNED	5		76 384 DATE/TIME 06-16-91 80
						ENSECO PRO	JECT NUMBER	570)			
ENS-1133				White	CHENT	Biele						



Rocky Mountain Analytical Laboratory 4955 Yarrow Street /. Arvada, CO 80002 303/421-6611 FAX: 303/431-7171

CHAIN OF CUSTODY SAMPLE SAFE^{IM} CONDITIONS ENSECO CLIENT PACKED BY CITY OF ST LOUIS PARK 7421 SEAL INTACT UPON RECEIPT BY SAMPLING COMPANY CONDITION OF CONTENTS SEALED FOR SHIPPING BY INITIAL CONTENTS TEMP SAMPLING COMPANY MIK °C SAME SAMPLING STATUS SAMPLING SITE ☐ Done Continuing Until 519146 SEAL INTACT UPON RECEIPT BY LAB CONTENTS TEMPERATURE LPON RECEIPT BY LAB TEAM LEADER 2128 ☐ Yes □ No SAMPLE ID/DESCRIPTION SAMPLE TYPE # CONTAINERS **ANALYSIS PARAMETERS** REMARKS DATE PPT PAH 56 PG M50-062591 IXL AMBER 6-25-91 PPT PAH 6-25-91 56PGFB-062591 IXL AMBER PPE PAH 51 PG FBD-062591 6-25-91 IXL AMBER **CUSTODY TRANSFERS PRIOR TO SHIPPING SHIPPING DETAILS** DELIVERED TO SHIPPER BY **RELINQUISHED BY (SIGNED) RECEIVED BY (SIGNED)** DATE TIME METHOD OF SHIPMENT AIRBILL NUMBER

White - CLIENT



Qualifier Codes and their Usage

- **U** = Indicates compound was analyzed for but not detected. The sample quantitation limit is corrected for dilution and for percent moisture. For soil samples subjected to GPC clean-up procedures, the CRQL (contract required quantitation limit) is multiplied by two to account for the fact that only half of the extract is recovered.
- J = Indicates an estimated value. This flag is used when the mass spectral data indicates the presence of a compound that meets the identification criteria but the result is less than the sample quantitation limit but greater than zero.
- B = This flag is used when the analyte is found in the associated blank as well as in the sample. B codes do not necessarily invalidate the data but are dependent upon the judgement of the reviewer in applying the validation guidelines. This flag is used for a TIC as well as for a positively identified target compound list (TCL) compound.
- E = This flag identifies compounds whose concentrations exceed the calibration range of the GC/MS instrument for that specific analysis.
- **D** = This flag identifies all compounds identified during a re-analysis of a diluted sample.
- A = This flag indicates that a TIC is a suspected aldol-condensation product.

SUMMARY

DATA

PACKAGE

FOR

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SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

15570-01

Q

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Lab Name: ENSECO-RMAL

CAS NO.

Contract No.:

Lab Code: ENSECO Case No.: 15570 SAS No.: SDG No.:

Matrix: (soil/water) WATER Lab Sample ID: 15570-01

Sample wt/vol: 4040 (g/ml) ML Lab File ID: X3189

Level: (low/med) LOW Date Received: 06/26/91

% Moisture: not dec. dec. Date Extracted: 06/27/91

Extraction: (SepF/Cont/Sonc) CONT Date Analyzed: 07/01/91

GPC Cleanup: (Y/N) N pH: 7.0 Dilution Factor: 0.124

COMPOUND

271-89-6----2,3-Benzofuran

218-01-9-----Chrysene

198-55-0----Perylene

205-99-2----Benzo(B)Fluoranthene

207-08-9----Benzo(K) Fluoranthene

193-39-5----Indeno(1,2,3-CD) Pyrene

53-70-3-----Dibenz(A,H)Anthracene

191-24-2----Benzo(G,H,I)Perylene

192-97-2----Benzo(E) Pyrene

50-32-8-----Benzo(A) Pyrene

CONCENTRATION UNITS: NG/L

5.1

2.8

2.5

2.3

1.9

2.3

2.5

2.1

1.6

2.8

496-11-7----2,3-Dihydroindene 32 6.1 95-13-6----1H-Indene 91-20-3----Naphthalene JB 2.3 4565-32-6----Benzo(B)Thiophene 2.7 U 91-22-5----Ouinoline 1.4 120-72-9-----1H-Indole 1.2 J 91-57-6----2-Methylnaphthalene 1.9 В 90-12-0----1-Methylnaphthalene J * 1.1 92-52-4----Biphenyl 1.8 J 208-96-8-----Acenaphthylene 1.7 83-32-9-----Acenaphthene 10 132-64-9-----Dibenzofuran 1.0 U 86-73-7----Fluorene U 1.0 132-65-0-----Dibenzothiophene 1.1 U 85-01-8-----Phenanthrene 2.7 U 120-12-7-----Anthracene 1.1 260-94-6----Acridine 2.9 U U 86-74-8-----Carbazole 1.9 206-44-0----Fluoranthene 1.4 129-00-0----Pyrene 2.5 56-55-3----Benzo(A) Anthracene U 2.5

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EPA SAMPLE NO.

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

15570-02

Lab Name: ENSECO-RMAL

Contract No.:

Lab Code: ENSECO Case No.: 15570 SAS No.: SDG No.:

Matrix: (soil/water) WATER Lab Sample ID: 15570-02

Sample wt/vol: 3940 (g/ml) ML Lab File ID: X3192

Level: (low/med) LOW Date Received: 06/26/91

% Moisture: not dec. dec. Date Extracted: 06/27/91

Extraction: (SepF/Cont/Sonc) CONT Date Analyzed: 07/02/91

GPC Cleanup: (Y/N) N pH: 7.0 Dilution Factor: 0.127

CONCENTRATION UNITS: NG/L

CAS NO. COMPOIND

COMPOUND		Q
2,3-Benzofuran	5.2	ט
2,3-Dihydroindene	_ 36	
1H-Indene	6.5	
Naphthalene	_ 2.4	JB*
Benzo(B)Thiophene	3.1	*
	1.4	İ
	_ 2.9	*
	_ 2.4	В
	1.3	J *
	1.9	J
Acenaphthylene	1	*
Acenaphthene	1	
	 !	ט
		ן ט
		ן ט
		В
	1	ט
	1	ע
		J *
Fluoranthene	<u> </u>	
	1	
Benzo(A)Anthracene		ט
Chrysene		ט
Benzo(B)Fluoranthene	_	ט
Benzo(K)Fluoranthene	2.3	ט
Benzo (E) Pyrene	1.9	ש
Benzo(A)Pyrene		ט
Perylene	2.5	ט
Indeno(1,2,3-CD)Pyrene	2.1	ט
Dibenz(A,H)Anthracene	1.6	ן ט
Benzo(G,H,I)Perylene	1.4	J
	2,3-Benzofuran2,3-Dihydroindene1H-IndeneNaphthaleneBenzo(B)ThiopheneQuinoline1H-Indole2-MethylnaphthaleneBiphenylAcenaphthyleneAcenaphtheneDibenzofuranFluoreneDibenzothiophenePhenanthreneArtidineCarbazoleFluorantheneBenzo(A)AnthraceneBenzo(B)FluorantheneBenzo(B)FluorantheneBenzo(C)PyreneBenzo(A)PyreneBenzo(A)Pyrene	2,3-Benzofuran 5.22,3-Dihydroindene 361H-Indene 6.5Naphthalene 2.4Benzo(B) Thiophene 3.1Quinoline 1.41H-Indole 2.92-Methylnaphthalene 2.41-Methylnaphthalene 1.3Biphenyl 1.9Acenaphthylene 1.7Acenaphthylene 1.0Fluorene 1.0Fluorene 1.0Phenanthrene 3.5Aridine 2.9Carbazole 1.2Fluoranthene 2.1

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

15570-03

Lab Name: ENSECO-RMAL Contract No.:

Lab Code: ENSECO Case No.: 15570 SAS No.: SDG No.:

Matrix: (soil/water) WATER Lab Sample ID: 15570-03

Sample wt/vol: 4180 (g/ml) ML Lab File ID: X3193

Level: (low/med) LOW Date Received: 06/26/91

% Moisture: not dec. dec. Date Extracted: 06/27/91

Extraction: (SepF/Cont/Sonc) CONT Date Analyzed: 07/02/91

GPC Cleanup: (Y/N) N pH: 7.0 Dilution Factor: 0.120

CONCENTRATION UNITS: NG/L

CAS NO.	COMPOUND	·	Q
271-89-6	2,3-Benzofuran	4.9	U
	2,3-Dihydroindene	1.3	
95-13-6	1H-Indene	0.9	ט
91-20-3	Naphthalene	4.3	JB
4565-32-6	Benzo(B)Thiophene	0.9	U
91-22-5	Quinoline	1.3	U
	1H-Indole	1.6	J *
	2-Methylnaphthalene	4.2	В
	1-Methylnaphthalene	2.3	*
	Biphenyl	4.1	ט
	Acenaphthylene	1.3	ט
	Acenaphthene	1.2	טן
	Dibenzofuran	1.0	ט
	Fluorene	1.2	*
	Dibenzothiophene	1.1	ט
85-01-8	Phenanthrene	3.2	В
120-12-7	Anthracene	1.1	ט
260-94-6	Acridine	2.8	ט
86-74-8	Carbazole	1.8	ט
206-44-0	Fluoranthene	1.5	
129-00-0	Pyrene	3.8	
56-55-3	Benzo(A) Anthracene	2.5	ซ
218-01-9	Chrysene	2.7	ט
	Benzo(B) Fluoranthene	2.4	ט
	Benzo(K) Fluoranthene	2.2	ט
	Benzo(E)Pyrene	1.8	ן ט
50-32-8	Benzo(A) Pyrene	2.2	ן ד
198-55-0	Perylene	2.4	ן ט
	Indeno(1,2,3-CD)Pyrene	2.0	ע
	Dibenz (A, H) Anthracene	1.5	U
	Benzo(G,H,I)Perylene	1.2	J *

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

15570-01MS

Lab Name: ENSECO-RMAL Contract No.:

Lab Code: ENSECO Case No.: 15570 SAS No.: SDG No.:

Matrix: (soil/water) WATER Lab Sample ID: 15570-01MS

Sample wt/vol: 4160 (g/ml) ML Lab File ID: X3190

Level: (low/med) LOW Date Received: 06/26/91

% Moisture: not dec. dec. Date Extracted: 06/27/91

Extraction: (SepF/Cont/Sonc) CONT Date Analyzed: 07/02/91

GPC Cleanup: (Y/N) N pH: 7.0 Dilution Factor: 0.120

CONCENTRATION UNITS: NG/L

CAS NO. COMPOUND Q 271-89-6----2,3-Benzofuran 4.9 U 496-11-7----2,3-Dihydroindene 29 95-13-6----1H-Indene 10 SC 91-20-3----Naphthalene 7.5 B SC 4565-32-6----Benzo(B) Thiophene 2.4 91-22-5----Quinoline 8.2 SC 120-72-9----1H-Indole 1.4 J * 91-57-6----2-Methylnaphthalene 8.9 B SC 90-12-0----1-Methylnaphthalene 1.3 J * 92-52-4----Biphenyl J 2.4 208-96-8-----Acenaphthylene 1.3 83-32-9----Acenaphthene 8.9 132-64-9-----Dibenzofuran 1.0 U 86-73-7----Fluorene SC 8.4 132-65-0-----Dibenzothiophene 1.1 U 85-01-8-----Phenanthrene 3.4 В 120-12-7-----Anthracene 1.1 U 260-94-6----Acridine 2.8 U 86-74-8-----Carbazole 1.8 U 206-44-0----Fluoranthene 1.4 129-00-0----Pyrene 1.7 56-55-3----Benzo(A)Anthracene 2.4 U 218-01-9-----Chrysene 5.2 SC 205-99-2----Benzo(B) Fluoranthene U 2.4 207-08-9----Benzo(K) Fluoranthene 2.2 U J *SC 192-97-2----Benzo(E) Pyrene 1.4 50-32-8----Benzo(A) Pyrene 2.2 U 198-55-0----Perylene 2.4 U 193-39-5----Indeno(1,2,3-CD)Pyrene 2.0 U 53-70-3-----Dibenz(A,H)Anthracene U 1.5 J * 191-24-2----Benzo(G,H,I)Perylene 1.2

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

15570-01MSD

Lab Name: ENSECO-RMAL Contract No.:

Lab Code: ENSECO Case No.: 15570 SAS No.: SDG No.:

Matrix: (soil/water) WATER Lab Sample ID: 15570-01MSD

Sample wt/vol: 4240 (q/ml) ML Lab File ID: X3197

Level: (low/med) LOW Date Received: 06/26/91

Extraction: (SepF/Cont/Sonc) CONT Date Analyzed: 07/08/91

GPC Cleanup: (Y/N) N pH: 7.0 Dilution Factor: 0.118

CONCENTRATION UNITS: NG/I

CAS NO. COMPOUND Q 271-89-6----2,3-Benzofuran 4.8 U 496-11-7----2,3-Dihydroindene 23 95-13-6-----1H-Indene 7.8 *SC 91-20-3----Naphthalene 5.9 J SC 4565-32-6----Benzo(B) Thiophene 1.7 91-22-5----Quinoline 5.2 120-72-9-----1H-Indole 1.0 J * 91-57-6----2-Methylnaphthalene 7.1 SC 90-12-0----1-Methylnaphthalene U 1.5 92-52-4-----Biphenyl 1.1 J 208-96-8-----Acenaphthylene U 1.3 83-32-9----Acenaphthene 6.3 132-64-9-----Dibenzofuran 0.9 U 86-73-7----Fluorene 5.7 SC 132-65-0-----Dibenzothiophene U 1.0 85-01-8-----Phenanthrene 1.5 U 120-12-7-----Anthracene 1.0 260-94-6-----Acridine U 2.7 86-74-8-----Carbazole 1.8 U 206-44-0----Fluoranthene 1.3 U 129-00-0-----Pyrene J 1.2 56-55-3----Benzo(A) Anthracene U 2.4 218-01-9-----Chrysene 2.1 J 205-99-2----Benzo(B) Fluoranthene 2.4 U 207-08-9----Benzo(K) Fluoranthene 2.2 U 192-97-2----Benzo(E) Pyrene U SC 1.8 U 50-32-8-----Benzo(A) Pyrene 2.2 198-55-0----Perylene U 2.4 U 193-39-5----Indeno(1,2,3-CD)Pyrene 2.0 53-70-3-----Dibenz(A,H)Anthracene U 1.5

191-24-2----Benzo(G,H,I)Perylene

U

2.6

2C
WATER SEMIVOLATILE SURROGATE RECOVERY

Lab Name: ENSECO-RMAL Contract:

Lab Code: ENSECO Case No.: 15570 SAS No.: SDG No.:

Level: (low/med) LOW

	EPA SAMPLE NO.	S1 (NAP) #	S2 (FLU) #	S3 (CHR) #
1	15570-01	88	93	53
2	15570-01MS	78	82	54
3	15570-01MSD	54	60	30
4	15570-02	103	105	63
5	15570-03	97	98	91
6	BLK01	94	94	88
7	BLK02	71	75	60
g١			<u> </u>	<u> </u>

				QC LIMITS
Sl	(NAP)	=	D8-NAPHTHALENE	(14-108)
S2	(FLU)	=	D10-FLUORENE	(41-162)
S3	(CHR)	=	D12-CHRYSENE	(10-118)

- # Column to be used to flag recovery values
- * Values outside of contract required QC limits
- D Surrogates diluted out

3C

WATER SEMIVOLATILE MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERY

Lab Name: ENSECO-RMAL Contract:

Lab Code: ENSECO Case No.: 15570 SAS No.: SDG No.:

Matrix Spike - EPA Sample No.: 15570-01 LEVEL: LOW

Compound	SPIKE ADDED (ng/L)	SAMPLE CONCENTRATION (ng/L)	MS CONCENTRATION (ng/L)	MS % REC
1H-Indene Naphthalene Quinoline 2-Methylnaphthalene	9.60 9.60 9.60 9.60	6.08 2.26 ND 1.93 ND	10.5 7.52 8.16 8.94 8.43	46 55 85 73 88
Fluorene Chrysene Benzo(E)Pyrene	9.60 9.60 9.60	ND ND ND	5.16 1.43	54 15

Compound	SPIKE ADDED (ng/L)	MSD CONCENTRATION (ng/L)	MSD % REC	ዩ RPD
1H-Indene	9.44	7.76	18	88
Naphthalene	9.44	5.87	38	37
Quinoline	9.44	5.18	55	43
2-Methylnaphthalene	9.44	7.10	55	28
Fluorene	9.44	5.67	60	38
Chrysene	9.44	2.08	22	84
Benzo(E) Pyrene	9.44	ND	ND	200

Comments:

4B SEMIVOLATILE METHOD BLANK SUMMARY

BLK01

Lab Name: ENSECO-RMAL Contract:

Lab Code: ENSECO Case No.: 15570 SAS No.: SDG No.:

Lab File ID: X3187 Lab Sample ID: BL062791

Instrument ID: 4500-X Date Extracted: 06/27/91

Matrix: (soil/water) WATER Date Analyzed: 07/01/91

Level: (low/med) LOW Time Analyzed: 2207

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS AND MSD:

	EPA SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED
1				========
1	15570-01	15570-01	X3189	06/27/91
2	15570-01MS	15570-01MS	X3190	06/27/91
3	15570-02	15570-02	X3192	06/27/91
4	15570-03	15570-03	X3193	06/27/91
-51				

Comments:

EPA SAMPLE NO.

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

BLK01

Lab Name: ENSECO-RMAL

Contract No.:

Lab Code: ENSECO Case No.: 15570 SAS No.: SDG No.:

Matrix: (soil/water) WATER Lab Sample ID: BLK01

Sample wt/vol: 4000 (g/ml) ML Lab File ID: X3187

Level: (low/med) LOW Date Received:

% Moisture: not dec. dec. Date Extracted: 06/27/91

Extraction: (SepF/Cont/Sonc) CONT Date Analyzed: 07/01/91

GPC Cleanup: (Y/N) N pH: 7.0 Dilution Factor: 0.125

CONCENTRATION UNITS: NG/L

CAS NO.	COMPOUND		Q
271-89-6	2,3-Benzofuran	5.1	U
496-11-7	2,3-Dihydroindene	_ 1.4	ן ט
	1H-Indene		ן ט
91-20-3	Naphthalene		J
	Benzo(B)Thiophene	0.9	ט
	Quinoline		ן טן
120-72-9	1H-Indole	2.5	ן ט
	2-Methylnaphthalene	1.3	
90-12-0	1-Methylnaphthalene	1.6	ן ט ן
	Biphenyl	_ 4.3	ן ט
	Acenaphthylene		ן טן
	Acenaphthene	1.3	ן טן
	Dibenzofuran	1.0	ן ט
	Fluorene	1.0	ן ט
132-65-0	Dibenzothiophene	1.1	ן ט
	Phenanthrene	1.1	
	Anthracene	1.1	ן ט
	Acridine	2.9	ן ט
	Carbazole	1.9	ן ט
206-44-0	Fluoranthene	1.4	ן ט
129-00-0	Pyrene	1.4	ן ט
56-55-3	Benzo(A) Anthracene	2.5	ן ט
218-01-9	Chrysene	2.8	ט
	Benzo(B) Fluoranthene	2.5	ן ט
207-08-9	Benzo(K) Fluoranthene	2.3	ט
192-97-2	Benzo(E)Pyrene	1.9	ן ט
50-32-8	Benzo(A)Pyrene	_ _{2.3}	U
198-55-0	Perylene	2.5	ี บ
193-39-5	Indeno(1,2,3-CD)Pyrene		ן ט
53-70-3	Dibenz (A, H) Anthracene	1.6	ן ט
191-24-2	Benzo(G,H,I)Perylene	2.8	ן מ
		<u> </u>	

4B SEMIVOLATILE METHOD BLANK SUMMARY

Lab Name: ENSECO-RMAL Contract:

BLK02

Lab Code: ENSECO Case No.: 15570 SAS No.: SDG No.:

Lab File ID: X3196 Lab Sample ID: BL070491

Instrument ID: 4500-X Date Extracted: 07/04/91

Matrix: (soil/water) WATER Date Analyzed: 07/08/91

Level: (low/med) LOW Time Analyzed: 2253

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS AND MSD:

	EPA	LAB	LAB	DATE
	SAMPLE NO.	SAMPLE ID	FILE ID	ANALYZED
1	15570-01MSD	15570-01MSD	X3197	07/08/91

Comments:

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

BLK02

Lab Name: ENSECO-RMAL Contract No.:

Lab Code: ENSECO Case No.: 15570 SAS No.: SDG No.:

Matrix: (soil/water) WATER Lab Sample ID: BLK02

Sample wt/vol: 4250 (g/ml) ML Lab File ID: X3196

Level: (low/med) LOW Date Received:

% Moisture: not dec. dec. Date Extracted: 07/04/91

Extraction: (SepF/Cont/Sonc) CONT Date Analyzed: 07/08/91

GPC Cleanup: (Y/N) N pH: 7.0 Dilution Factor: 0.118

CONCENTRATION UNITS: NG/L

CAS NO.	COMPOUND		Q
271-89-6-	2,3-Benzofuran	4.8	U
496-11-7-	2,3-Dihydroindene	1.3	ט
	1H-Indene	0.8	ן ט
91-20-3	Naphthalene	6.1	U
4565-32-6	Benzo(B)Thiophene	0.8	ן ט
91-22-5	Quinoline	1.3	U
	1H-Indole	2.4	ן ט
91-57-6	2-Methylnaphthalene	0.8	ן ט
90-12-0	1-Methylnaphthalene	1.5	ן ט
	Biphenyl	4.1	ប
208-96-8	Acenaphthylene	1.3	ט
83-32-9-	Acenaphthene	1.2	ן ט
	Dibenzofuran	0.9	U
	Fluorene	0.9	U
132-65-0	Dibenzothiophene	1.0	U
85-01-8	Phenanthrene	1.2	ע
	Anthracene	1.0	[ซ
	Acridine	2.7	ן ט
	Carbazole	1.8	ן ט
	Fluoranthene	1.3	ן ט
	Pyrene	1.3	ן די
56-55-3	Benzo(A)Anthracene	2.4	ซ
218-01-9	Chrysene	2.6	U
205-99-2	Benzo(B) Fluoranthene	2.4	U
207-08-9	Benzo(K) Fluoranthene	2.2	U
192-97-2	Benzo (E) Pyrene	1.8	U
50-32-8	Benzo(A)Pyrene	2.2	ט
198-55-0	Perylene	2.4	U
	Indeno(1,2,3-CD)Pyrene	2.0	U
	Dibenz (A, H) Anthracene	1.5	U
191-24-2	Benzo(G,H,I)Perylene	2.6	ช _

Lab Name: ENSECO-RMAL Contract No:

Lab Code: ENSECO Case No: 15570 SAS No: SDG No:

SAMPLE ID	LAB FILE ID	DATE OF ANALYSIS	TIME OF ANALYSIS
40 PPB PAH STD	X3186	07/01/91	1925
BLK01	X3187	07/01/91	2207
15570-01	X3189	07/02/91	2349
15570-01MS	X3190	07/02/91	0042
15570-02	X3192	07/02/91	0227
15570-03	X3193	07/02/91	0319

Lab Name: ENSECO-RMAL Contract No:

Lab Code: ENSECO Case No: 15570 SAS No: SDG No:

SAMPLE ID	LAB FILE ID	DATE OF ANALYSIS	TIME OF ANALYSIS
40 PPB_PAH_STD	X3195	07/08/91	1835
BLK02	X3196	07/08/91	2253
15570-01MSD	X3197	07/08/91	2344

INITIAL CALIBRATION DATA PAH COMPOUNDS

Lab Name: ENSECO-RMAL Lab Code: ENSECO Case No: 15570

Instrument ID: 4500-X Calibration Date(s): 03/25/91

Maximum % RSD is 35%

Lab File ID: RRF 20= X2941 RRF 40= X2940 RRF 240= X2942 RRF 1200= X2943 RRF 4800= X2944							
COMPOUND	20 PPB RRF	40 PPB RRF	240PPB RRF	1200PPB RRF	4800PPB RRF	AVE RRF	%RSD
2,3-Benzofuran	0.932	0.934	0.887	0.921	0.926	0.920	2.1
2,3-Dihydroindene	0.726	0.781	0.762	0.802	0.805	0.775	4.2
1H-Indene	0.743	0.817	0.739	0.788	0.794	0.776	4.4
Naphthalene	1.722	1.639	1.730	1.794	1.817	1.740	4.0
Benzo(B)Thiophene	1.342	1.230	1.277	1.319	1.330	1.300	3.5
Quinoline	0.592	0.740	0.815	0.961	1.029	0.827	
1H-Indole	0.820	0.788	0.928	1.029	1.074	0.928	
2-Methylnaphthalene	0.673	0.766	0.753	0.783	0.795	0.756	6.5
1-Methylnaphthalene	0.727	0.800	0.814	0.849	0.858	0.810	6.4
Biphenyl	1.060	1.117	1.201	1.263	1.273	1.183	7.8
Acenaphthylene	1.280	1.387	1.493	1.714	1.796	1.534	
Acenaphthene	1.004	0.998	1.052	1.117	1.115	1.057	5.5
Dibenzofuran	1.257	1.271	1.399	1.466	1.488	1.376	7.8
Fluorene	1.039	1.089	1.150	1.223	1.248	1.150	7.7
Dibenzothiophene	0.837	0.810	0.815	0.861	0.802	0.825	2.9
Phenanthrene	0.835	0.880	0.888	0.940	0.885	0.886	4.2
Anthracene	0.669	0.787	0.849	0.949	0.913	0.833	13.3
Acridine	0.320	0.442	0.529	0.692	0.685	0.534	29.9
Carbazole	0.645	0.618	0.703	0.787	0.754	0.701	10.1
Fluoranthene	0.930	1.016	0.984	1.079	1.020	1.006	5.4
Pyrene	1.238	1.180	1.050	1.102	1.044	1.123	7.5
Benzo(A) Anthracene	1.038	1.130	1.248	1.222	1.135	1.155	7.2
Chrysene	1.414	1.388	1.354	1.245	1.132	1.307	8.9
Benzo(B) Fluoranthene	1.029	1.039	1.054	1.060	1.053	1.047	1.2
Benzo(K) Fluoranthene	1.543	1.271	1.598	1.356	1.346	1.423	9.8
Benzo(E) Pyrene	1.088	1.152	1.075	1.033	0.968	1.063	6.4
Benzo(A) Pyrene	0.930	1.027	1.052	1.077	1.016	1.020	5.5
Perylene	0.729	0.740	0.809	0.467	0.830	0.715	
Indeno(1,2,3-CD)Pyrene		1.158	1.156	1.222	1.154	1.196	5.0
Dibenz (A, H) Anthracene	1.040	1.021	1.056	1.060	1.020	1.039	1.8
Benzo(G,H,I)Perylene	1.068	1.067	1.118	1.084	1.026	1.073	3.1
D8-Naphthalene	1.530	1.508	1.569	1.622	1.661	1.578	4.0
D10-Flourene	0.860	0.863	0.931	1.000	1.024	0.936	8.1
D12-Chrysene	1.410	1.193	1.139	1.029	0.944	1.143	15.6

CONTINUING CALIBRATION DATA PAH COMPOUNDS

Lab Name: ENSECO-RMAL Lab Code: ENSECO Case No: 15570

Instrument ID: 4500-X Calibration Date(s): 07/01/91 Time: 1925

Lab ID: X3186 Initial Calibration Date: 03/25/91

Maximum %D is 35%

COMPOUND	INITIAL AVE RRF	40 PPB RRF	%D
2,3-Benzofuran	0.920	1.055	-14.7
2,3-Dihydroindene	0.775	0.948	-22.3
1H-Indene	0.776	0.893	-15.1
Naphthalene	1.740	2.201	-26.5
Benzo(B)Thiophene	1.300	1.430	-10.0
Quinoline	0.827	0.977	-18.1
1H-Indole	0.928	1.001	-7.9
2-Methylnaphthalene	0.756	0.876	-15.9
1-Methylnaphthalene	0.810	0.932	-15.1
Biphenyl	1.183	1.313	-11.0
Acenaphthylene	1.534	1.681	-9.6
Acenaphthene	1.057	1.105	-4.5
Dibenzofuran	1.376	1.444	-4.9
Fluorene	1.150	1.176	-2.3
Dibenzothiophene	0.825	0.882	-6.9
Phenanthrene	0.886	0.931	-5.1
Anthracene	0.833	0.844	-1.3
Acridine	0.534	0.529	0.9
Carbazole	0.701	0.699	0.3
Fluoranthene	1.006	1.065	-5.9
Pyrene	1.123	1.110	1.2
Benzo (A) Anthracene	1.155	1.190	-3.0
Chrysene	-1.307	1.260	3.6
Benzo(B) Fluoranthene	1.047	1.171	-11.8
Benzo(K) Fluoranthene	1.423	1.131	20.5
Benzo(E) Pyrene	1.063	1.060	0.3
Benzo(A) Pyrene	1.020	0.974	4.5
Perylene	0.715	0.777	-8.7
Indeno(1,2,3-CD)Pyrene	1.196	1.048	12.4
Dibenz(A,H)Anthracene	1.039	0.962	7.4
Benzo(G,H,I)Perylene	1.073	0.980	8.7
D8-Naphthalene	1.578	1.787	-13.2
D10-Flourene	0.936	0.912	2.6
D12-Chrysene	1.143	1.027	10.1

CONTINUING CALIBRATION DATA PAH COMPOUNDS

Lab Name: ENSECO-RMAL Lab Code: ENSECO Case No: 15570

Instrument ID: 4500-X Calibration Date(s): 07/08/91 Time: 1835

Lab ID: X3195 Initial Calibration Date: 03/25/91

Maximum %D is 35%

COMPOUND	INITIAL AVE RRF	40 PPB RRF	%D
2,3-Benzofuran	0.920	0.945	-2.7
2,3-Dihydroindene	0.775	0.867	-11.9
1H-Indene	0.776	0.793	-2.2
Naphthalene	1.740	1.931	-11.0
Benzo(B)Thiophene	1.300	1.356	-4.3
Quinoline	0.827	0.832	-0.6
1H-Indole	0.928	0.930	-0.2
2-Methylnaphthalene	0.756	0.895	-18.4
1-Methylnaphthalene	0.810	1.011	-24.8
Biphenyl	1.183	1.335	-12.8
Acenaphthylene	1.534	1.457	5.0
Acenaphthene	1.057	1.087	-2.8
Dibenzofuran	1.376	1.405	-2.1
Fluorene	1.150	1.137	1.1
Dibenzothiophene	0.825	0.787	4.6
Phenanthrene	0.886	0.932	-5.2
Anthracene	0.833	0.756	9.2
Acridine	0.534	0.404	24.3
Carbazole	0.701	0.620	11.6
Fluoranthene	1.006	0.976	3.0
Pyrene	1.123	1.123	0.0
Benzo(A) Anthracene	1.155	1.162	-0.6
Chrysene	1.307	1.263	3.4
Benzo(B) Fluoranthene	1.047	1.162	-11.0
Benzo (K) Fluoranthene	1.423	1.084	23.8
Benzo(E) Pyrene	1.063	0.987	7.1
Benzo(A) Pyrene	1.020	0.891	12.6
Perylene	0.715	0.697	2.5
Indeno(1,2,3-CD)Pyrene	1.196	0.940	21.4
Dibenz (A, H) Anthracene	1.039	0.963	7.3
Benzo(G,H,I)Perylene	1.073	0.893	16.8
D8-Naphthalene	1.578	1.769	-12.1
D10-Flourene	0.936	0.997	-6.5
D12-Chrysene	1.143	1.148	-0.4

8C SEMIVOLATILE INTERNAL STANDARD AREA SUMMARY

Lab Name: ENSECO-RMAL Contract:

Lab Code: ENSECO Case No: 15570 SAS No.: SDG No:

Lab File ID (Standard): X3186 Date Analyzed: 07/01/91

Instrument ID: 4500-X Time Analyzed: 1925

	IS#1 (ACN) AREA #	IS#2 (PHN) AREA #	IS#3 (BAP) AREA #
12 HOUR STD	537000	918000	631000
UPPER LIMIT	1074000	1836000	1262000
LOWER LIMIT	268000	459000	316000
SAMPLE NO.			
15570-01 15570-01MS 15570-02 15570-03 BLK01	602000 589000 609000 509000 416000	1051000 920000 965000 828000 737000	748000 613000 669000 584000 463000

IS#1 (ACN) = D10-ACENAPHTHENE UPPER LIMIT = + 100% of internal standard area

IS#3 (BAP) = D12-BENZO(A)PYRENE LOWER LIMIT = - 50% of internal standard area

Column used to flag internal standard area values with an asterisk

8C SEMIVOLATILE INTERNAL STANDARD AREA SUMMARY

Lab Name: ENSECO-RMAL Contract:

Lab Code: ENSECO Case No: 15570 SAS No.: SDG No:

Lab File ID (Standard): X3195 Date Analyzed: 07/08/91

Instrument ID: 4500-X Time Analyzed: 1835

	IS#1 (ACN) AREA #	IS#2 (PHN) AREA #	IS#3 (BAP) AREA #
12 HOUR STD	588000	1110000	689000
UPPER LIMIT	1176000	2220000	1378000
LOWER LIMIT	294000	555000	344000
SAMPLE NO.			
15570-01MSD BLK02	675000 393000	1232000 761000	804000 496000

IS#1 (ACN) = D10-ACENAPHTHENE UPPER LIMIT = + 100%
IS#2 (PHN) = D10-PHENANTHRENE of internal standard area
IS#3 (BAP) = D12-BENZO(A) PYRENE LOWER LIMIT = - 50%
of internal standard area

Column used to flag internal standard area values with an asterisk



CASE NARRATIVE

for

City of St. Louis Park

June 21, 1991

Enseco - RMAL Project Number 014773

Introduction

Twelve aqueous samples (including MS and MSD) were received at Enseco Rocky Mountain Analytical Laboratory on May 1, 1991. The samples were logged in under RMAL project number 014773. Sample PCJ-SLP6FB-043091 (RMAL# 014773-03) was extracted and held as per the QAPP. A cross reference associating the RMAL sample numbers to the actual field sample numbers is included. The samples were analyzed for low level part-per-trillion (ppt) polynuclear aromatic hydrocarbons (PAH).

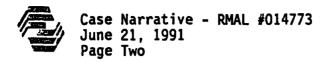
Data Quality Assessment

The results contained in this report were reviewed relative to data acceptance criteria as specified in the 1989 QAPP for completeness, precision, accuracy, representativeness and defensibility of the data. Unless otherwise stated below, no quality control problems or technical difficulties were encountered which would impact the interpretation or use of data in this report.

PPT PAH

Samples 014773-06 and 09 were analyzed and reported at dilutions due to interference with the internal standards during the original analysis. The reanalysis data are reported. Surrogates could not be measured in these samples due to the dilutions performed.

All samples show target compounds that do not meet secondary ion confirmation. In some instances a compound that does not meet secondary ion confirmation criteria may still be determined to be present in the sample after close inspection of the data by the analyst. Supportive data includes mass chromatograms maxima at the same scan for primary and secondary ions, as well as discernible quantitation interference with the secondary ion. These compounds are flagged with the asterisk (*) on the data sheets (Form I) as per the 1989 QAPP.



This data package is in compliance with the terms and conditions of the 1989 QAPP, both technically and for completeness, for other than the conditions detailed above.

Reported by

Tracy Conroy

Data Control Supervisor

Approved by:

Joe Holtz

Program Administrator

Date: 06-21-91

Date: 6-21-9/



SAMPLE DESCRIPTION INFORMATION for City of St. Louis Park

Lab ID	Client ID	Matrix	Sampled Date	d Received Time Date
014773-0001-SA 014773-0001-MS 014773-0001-SD 014773-0002-SA 014773-0003-SA 014773-0005-SA 014773-0006-SA 014773-0007-SA 014773-0008-SA 014773-0009-SA 014773-0010-SA	PCJ-SLP6-043091 PCJ-SLP6MS-043091 PCJ-SLP6MSD-043091 PCJ-SLP6D-043091 PCJ-SLP6FB-043091 PCJ-SLP7-043091 W122 W409 W408 P116 W411 W129	AQUEOUS AQUEOUS AQUEOUS AQUEOUS AQUEOUS AQUEOUS AQUEOUS AQUEOUS AQUEOUS AQUEOUS AQUEOUS AQUEOUS AQUEOUS	30 APR 91 1 30 APR 91 0 30 APR 91 1 30 APR 91	01 MAY 91 01 MAY 91 01 MAY 91 01 MAY 91 01 MAY 91 01 MAY 91 12:25 01 MAY 91 10:25 01 MAY 91 10:15 01 MAY 91 13:40 01 MAY 91 14:20 01 MAY 91



Qualifier Codes and their Usage

- U = Indicates compound was analyzed for but not detected. The sample quantitation limit is corrected for dilution and for percent moisture. For soil samples subjected to GPC clean-up procedures, the CRQL (contract required quantitation limit) is multiplied by two to account for the fact that only half of the extract is recovered.
- J = Indicates an estimated value. This flag is used when the mass spectral data indicates the presence of a compound that meets the identification criteria but the result is less than the sample quantitation limit but greater than zero.
- N = Indicates presumptive evidence of a compound. This flag is only used for tentatively identified compounds, where the identification is based on a mass spectral library search. It is applied to all TIC results.
- B = This flag is used when the analyte is found in the associated blank as well as in the sample. B codes do not necessarily invalidate the data but are dependent upon the judgement of the reviewer in applying the validation guidelines. This flag is used for a TIC as well as for a positively identified target compound list (TCL) compound.
- E = This flag identifies compounds whose concentrations exceed the calibration range of the GC/MS instrument for that specific analysis.
- D = This flag identifies all compounds identified during a re-analysis of a diluted sample.
- A = This flag indicates that a TIC is a suspected aldol-condensation product.

EPA SAMPLE NO.

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

14773-04

Lab Name: ENSECO-RMAL Contract No.:

Lab Code: ENSECO Case No.: 14773 SAS No.: SDG No.:

Matrix: (soil/water) WATER Lab Sample ID: 14773-04

Sample wt/vol: 4150 (g/ml) ML Lab File ID: X3066

Level: (low/med) LOW Date Received: 05/01/91

Extraction: (SepF/Cont/Sonc) CONT Date Analyzed: 06/04/91

GPC Cleanup: (Y/N) N pH: 6.0 Dilution Factor: 0.120

CAS NO.	COMPOUND	<u> </u>	Q
	2,3-Benzofuran	4.9	U
	2,3-Dihydroindene	9.6	1
95-13-6	1H-Indene	0.9	U
	Naphthalene	2.9	JB
	Benzo(B)Thiophene	0.9	ט
	Quinoline	1.3	U
1	1H-Indole	2.4	ן ט
91-57-6	2-Methylnaphthalene	3.0	В
90-12-0	1-Methylnaphthalene	1.7	*
	Biphenyl	1.1	J *
208-96-8	Acenaphthylene	3.7	
	Acenaphthene	8.5	!
	Dibenzofuran	1.0	U
	Fluorene	1.0	U
132-65-0	Dibenzothiophene	1.1	ט
85-01-8	Phenanthrene	2.0	B*
	Anthracene	1.1	U
260-94-6	Acridine	2.8	ט
86-74-8	Carbazole	1.8	U
206-44-0	Fluoranthene	1.1	J
129-00-0	Pyrene	3.6	В
56-55-3	Benzo(A) Anthracene	2.4	U
218-01-9	Chrysene	2.7	U
205-99-2	Benzo(B)Fluoranthene	2.4	Ū
	Benzo(K)Fluoranthene	2.2	ט
	Benzo(E) Pyrene	1.8	บ
	Benzo(A)Pyrene	2.2	ט
	Perylene	2.4	ប
	Indeno(1,2,3-CD)Pyrene	2.0	U
	Dibenz(A,H)Anthracene	1.5	U
	Benzo(G,H,I)Perylene	2.7	ט

RAP SECTION 7.3.(C) MONITORING

3RD QUARTER - 1991



CASE NARRATIVE

FOR

City of St. Louis Park

October 26, 1991

Enseco - RMAL Project Number 016687

Introduction

Fifteen aqueous samples (includes QC) were received at Enseco Rocky Mountain Analytical Laboratory on August 28, 1991. The samples were logged in under RMAL project number 016687. Sample PCJ-SLP6FBD-082791 (RMA # 016687-04) was extracted and held as per the QAPP. A cross reference associating the RMAL sample numbers to the actual field sample numbers is included. The samples were analyzed for part-per-trillion (ppt) polynuclear aromatic hydrocarbons (PAH).

Data Quality Assessment

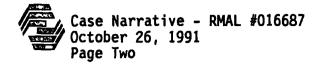
The results contained in this report were reviewed relative to data acceptance criteria as specified in the April 1990 QAPP for completeness, precision, accuracy, representativeness and defensibility of the data. Unless otherwise stated below, no quality control problems or technical difficulties were encountered which would impact the interpretation or use of data in this report.

PPT PAH

Due to concentrations of target compounds present in excess of calibration range, samples 016687-08, 10, 11, 12 and 13 were analyzed at a dilution. Surrogates could not be measured in the samples due to the dilutions performed.

In the matrix spike/spike duplicate analyses for sample 16687-01, several spike components are outside control limits. Indene and Napthalene results are biased due to the presence of these compounds in the original sample. Chrysene and Benzene show low recoveries. All quantitations were checked and found to be correct. Due to limited sample available, reextractions could not be performed.

Enseco Incorporated 4955 Yarrow Street Arvada, Colorado 80002 303/421-6611 Fax: 303/431-7171



Samples 16687-02, 03, 05, 06, 01MSD show surrogates which have exceeded the upper control limits. All instrument calibration, surrogate standard concentration, etc. were checked and found to be in control. It has been concluded that an interference specific to the surrogate is present which resulted in the high recovery. This interference does not affect the quantitation of target compounds.

Surrogate recoveries for D8-napthalene and D12-chrysene have exceeded control limits in both method blanks indicating a slight over concentration of the sample or a spike addition error during the extraction process. Target compound data for both method blanks were evaluated and found to be within control, therefore data is accepted.

The 4800 ng/ml and the 2400 ng/ml standards had excessive saturation, therefore they were not used as the upper range for the 5-point calibration curve. Instead, the 1200 ng/ml was used as a high point calibration, while a 600 ng/ml was used for the mid-point calibration.

All samples show target compounds that do not meet secondary ion confirmation. In some instances a compound that does not meet secondary ion confirmation criteria may still be determined to be present in the sample after close inspection of the data by the analyst. Supportive data includes mass chromatograms maxima at the same scan for primary and secondary ions, as well as discernible quantitation interference with the secondary ion. These compounds are flagged with asterisk (*) on the data sheets (Form I) as per the 1990 QAPP.

This data package is in compliance with the terms and conditions of the 1990 QAPP, both technically and for completeness, for other than the conditions detailed above.

Reported by:

racy Control Supervisor

or

Approved by:

Debbie Fazio ()

Program Administrator

Date: 10/26/21

Date: 10/06/9)



SAMPLE DESCRIPTION INFORMATION for City of St. Louis Park

Lab ID Client ID Matrix Date Time Date 016687-0001-SA PCJ-SLP6-082791 AQUEOUS 27 AUG 91 28 AUG 91 016687-0001-SD PCJ-SLP6MS-082791 AQUEOUS 27 AUG 91 28 AUG 91 016687-0002-SA PCJ-SLP6MSD-082791 AQUEOUS 27 AUG 91 28 AUG 91 016687-0003-SA PCJ-SLP6FB-082791 AQUEOUS 27 AUG 91 28 AUG 91 016687-0004-SA PCJ-SLP6FBD-082791 AQUEOUS 27 AUG 91 28 AUG 91 016687-0005-SA PCJ-SLP14-082791 AQUEOUS 27 AUG 91 28 AUG 91 016687-0006-SA PCJ-SLP16-082791 AQUEOUS 27 AUG 91 28 AUG 91 016687-0007-SA PCJ-SLP7-082791 AQUEOUS 27 AUG 91 28 AUG 91 016687-0009-SA STPW411082791 AQUEOUS 27 AUG 91 15:30 28 AUG 91 016687-0010-SA STPW409082791				Sa	mp l	ed	Rece	e i ve	d
016687-0001-MS PCJ-SLP6MS-082791 AQUEOUS 27 AUG 91 28 AUG 91 016687-0001-SD PCJ-SLP6MSD-082791 AQUEOUS 27 AUG 91 28 AUG 91 016687-0002-SA PCJ-SLP6FB-082791 AQUEOUS 27 AUG 91 28 AUG 91 016687-0004-SA PCJ-SLP6FBD-082791 AQUEOUS 27 AUG 91 28 AUG 91 016687-0005-SA PCJ-SLP14-082791 AQUEOUS 27 AUG 91 28 AUG 91 016687-0006-SA PCJ-SLP16-082791 AQUEOUS 27 AUG 91 28 AUG 91 016687-0007-SA PCJ-SLP7-082791 AQUEOUS 27 AUG 91 28 AUG 91 016687-0008-SA STPW411082791 AQUEOUS 27 AUG 91 15:30 28 AUG 91 016687-0010-SA STPW409082791 AQUEOUS 27 AUG 91 14:10 28 AUG 91 016687-0011-SA STPW408082791 AQUEOUS 27 AUG 91 11:20 28 AUG 91 016687-0012-SA STPW122082791 AQUEOUS 27 AUG 91	Lab ID	Client ID	Matrix				Da	ite	
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FOR

CITY OF ST. LOUIS PARK

RMAL PROJECT# 016727

PPT-PAH

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Daw OC Data	1267



Qualifier Codes and their Usage

- U = Indicates compound was analyzed for but not detected. The sample quantitation limit is corrected for dilution and for percent moisture. For soil samples subjected to GPC clean-up procedures, the CRQL (contract required quantitation limit) is multiplied by two to account for the fact that only half of the extract is recovered.
- J = Indicates an estimated value. This flag is used when the mass spectral data indicates the presence of a compound that meets the identification criteria but the result is less than the sample quantitation limit but greater than zero.
- N = Indicates presumptive evidence of a compound. This flag is only used for tentatively identified compounds, where the identification is based on a mass spectral library search. It is applied to all TIC results.
- P = This flag is used for a pesticide/Aroclor target analyte when there is greater than 25% difference for detected concentrations between the two GC columns. The lower of the two values is reported.
- B = This flag is used when the analyte is found in the associated blank as well as in the sample. B codes do not necessarily invalidate the data but are dependent upon the judgement of the reviewer in applying the validation guidelines. This flag is used for a TIC as well as for a positively identified target compound list (TCL) compound.
- E = This flag identifies compounds whose concentrations exceed the calibration range of the GC/MS instrument for that specific analysis.
- D = This flag identifies all compounds identified during a re-analysis of a diluted sample.
- A = This flag indicates that a TIC is a suspected aldol-condensation product.

4	Enseco -	Rocky	Mountain	Analytical
	4955 Yarrow S	treet		

Enseco - Rocky Mountain Analytical 4955 Yarrow Street		CHAIN OF CUSTODY		SAMPLE SAFE" COND	No. SAMPLE SAFE" CONDITIONS			
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Date	Time	Sample ID/Description	Sample Type	No Containers	Analysis Parameters		Remarks	
	1 1			1		i	DAM.	

Date	Time	Sample ID/Description	Sample Type	No Containers	Analysis Parameters	Remarks
8-27-91		PEU-5LPG - 082791	IXL AMBER	6	א הים דקק	1.6887 01
8-27-91		PCJ-51P60-082791	IXL AMOER	6	HAN JAA	OZ.
8-27.91		PED-51 P 6 175 - 082791	IYL AMDER		1400 Jag	المراق
						
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Relinquished by (signed) Received by. (signed)		Delivered to Shipper by. 2424
·		Received for Lab RMAL Signed 1111 Date/Time 9/24/9/
2		
3		r o Project No

🕏 Enseco - Rocky Mountain Analytica	🕏 Ensec	o - Rocky	Mountain	Analytical
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CHAIN OF CUSTODY

No.

Done Continuing Until ______

4955 Yarrow Street Arvada, Colorado 80002 303/421-6611 Facsimile 303/431-7171

Enseco Client CITY OF ST LOUIS PARK

Team Leader 712 72

SAMPLE SAFE" CONDITIONS

1 Packed by ______ Seal # _____

2 Seal Intact Upon Receipt by Sampling Co Yes No

3 Condition of Contents:

4 Sealed for Shipping by 223

5 Initial Contents Temp _____°C Seal # _____

7 Seal Intact Upon Receipt by Laboratory Yes No

8 Contents Temperature Upon Receipt by Lab ______ °C

9 Condition of Contents:

6 Sampling Status

Date	Time	Sample ID/Description	Sample Type	No Containers	Analysis Parameters	Remarks
8-27-91		PEJ-51P6 750-082791	IXL AMBER	6	PPT PAH	16887. Olmsp
8-27-91		PEN-54 PG FB-082791	IXL AMBER	6	PPT PAIL	03
8-27-9(PCU-54PGFBD-08279/	IXLAMDER	6	PPT PAH PPT PAH	O4
		,				
		/				
					,	
			_			

CUSTODY	RANSFERS PRIOR TO SHIPP	ING	- 1	SHIPPING DETAILS
Relinquished by (signed)	Received by. (signed)	Date	Time	Delivered to Shipper by
1				Method of Shipment. FEd Exp Airbill # 2567/73, 3
2				Received for Lab RMAL Signed MILES Date/Time \$/28/A
3				Enseco Project No

🕏 Enseco - Rocky Mountain Analytica

CHAIN OF CUSTODY

No.

4955 Yarrow Street Arvada, Colorado 80002 303/421-6611 Facsimile, 303/431-7171

Altn: _____

Enseco Client CITY OF ST LOUIS PARK Project _

Sampling Co. SAME

Sampling Site ______ SAME

SAMPLE SAFE" CONDITIONS

24281 1 Packed by. ____

2. Seal Intact Upon Receipt by Sampling Co. No 3 Condition of Contents. ___

4 Sealed for Shipping by 212-39

5 Initial Contents Temp . ___ _°C Seal # ______

6. Sampling Status Done Continuing Until ___

Yes 7. Seal Intact Upon Receipt by Laboratory No

8 Contents Temperature Upon Receipt by Lab _____ °C

9 Condition of Contents. ____

Date	Time	Sample ID/Description	Sample Type	No. Containers	Analysis Parameters	Remarks
8-27-9/		PCJ-54P14-082791	IXL AMOER		PPT PAH	16857 OS
8-27-91		PEN-SLP 16-082791	IXLAMOER	6	PPT PAY	٥٥
8-27-9/		PCJ-SLP7 -082791	IXL AMOCK		PPT PAH PPT PAH	67-
,						

CUSTODY TRANSFERS PRIOR TO SHIPPING				SHIPPING DETAILS
Relinquished by. (signed)	Received by. (signed)	Date	Time	Delivered to Shipper by. 2222
1		 .		Method of Shipment.
2				Received for Lab. AMAL Signed My Date/Time 8/29/91
3				Enseco Project No

49: Ar 30: Att Ensecce Projec Sampli	55 Yarrow 9 vada, Color 8/421-6611 in: Collient t ing Co ing Site		17	2. Seal Intact U 3. Condition of 4. Sealed for Sh 5. Initial Conter 6. Sampling Sta 7. Seal Intact U 8. Contents Ter	pon Receipt by Sampling Co: Contents: hipping by: Contents: Done Continuing Until pon Receipt by Laboratory. Imperature Upon Receipt by Lab: Contents:	Yes No Yes No Yes No Yes No
Date	Time	Sample ID/Description	Sample Type	No. Containers	Analysis Parameters	Remarks
		W44	hATER		PPT & PAH	16887
12/9/	1530	STP W411082791.		6	<u> </u>	OF
1		5TP7116 082791		.		09
<u></u>		STP 10409082791				10
Reling(ighed by: (1	QUSTODY TRANSFERS PRIOR TO SHIPPING signed). Received by: (signed)		Delivered to Shipper by:	SHIPPING DETAILS Alrbill #_ Signed. 774 55000	Date/Time S/28/91 08:00



Rocky Mountain Analytical Laboratory 4955 Yarrow Street

Arvada, CO 80002 303/421-6611 FAX: 303/431-7171 **CHAIN OF CUSTODY** SAMPLE SAFE'M CONDITIONS ENSECO CLIENT PACKED BY SEAL NUMBER PROJECT SEAL INTACT UPON RECEIPT BY SAMPLING COMPANY CONDITION OF CONTENTS CITY OF ST. LUIS PARK INITIAL CONTENTS TEMP °C BAMPLING SITE CUASVITIAL & CHEMERAILE Done Continuing Until TEAM LEADER SEAL INTACT UPON RECEIPT BY LAB CONTENTS TEMPERATURE LPON RECEIPT BY LAB Yes °C SAMPLE ID/DESCRIPTION ANALYSIS PARAMETERS SAMPLE TYPE # CONTAINERS DATE TIME REMARKS 517W4C8 EXZ791 PPTE PHI 1120 16887 WATER STPW122 082791 578 W124 082791

SHIPPING DETAILS **CUSTODY TRANSFERS PRIOR TO SHIPPING** DELIVERED TO SHIPPER BY RELINQUISHED BY (SIGNED) RECEIVED BY (SIGNED) DATE TIME AIRBILL NUMBER RECEIVED FOR LAB ENSECO PROJECT NUMBER

ENS-1133

SUMMARY

DATA

PACKAGE

FOR

Anal W 16689

EPA SAMPLE NO.

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

1B

16687-01

Lab Name: ENSECO Contract No.:

Lab Code: ENSECO Case No.: 16687 SAS No.: SDG No.:

Matrix: (soil/water) WATER Lab Sample ID: 16687-01

Sample wt/vol: 4240 (g/ml) ML Lab File ID: C4705

Level: (low/med) LOW Date Received: 08/28/91

% Moisture: not dec. dec. Date Extracted: 08/30/91

Extraction: (SepF/Cont/Sonc) CONT Date Analyzed: 09/25/91

GPC Cleanup: (Y/N) N pH: 7.0 Dilution Factor: 0.118

CAS NO.	COMPOUND	·	Q
271-89-6	2,3-Benzofuran	5.0	*
	2,3-Dihydroindene	51	B *
95-13-6	1H-Indene	9.2	İ
91-20-3	Naphthalene	14	В
4565-32-6	Benzo(B)Thiophene	3.9	1
91-22-5	Quinoline	1.3	U
120-72-9	1H-Indole	2.4	U
91-57-6	2-Methylnaphthalene	4.6	В
90-12-0	1-Methylnaphthalene	2.9	*
92-52-4	Biphenvl	2.4	J *
208-96-8	Acenaphthylene	1.3	ט
83-32-9	Acenaphthene	14	
132-64-9	Dibenzofuran	0.9	U
86-73-7	Fluorene	0.98	*
132-65-0	Dibenzothiophene	1.0	U
85-01-8	Phenanthrene	2.2	В
120-12-7	Anthracene	1.0	U
260-94-6	Acridine	2.7	ט
86-74-8	Carbazole	1.9	*
206-44-0	Fluoranthene	1.3	
129-00-0	Pyrene	1.1	J
56-55-3	Benzo(A) Anthracene	2.4	U
218-01-9	Chrysene	2.6	U
205-99-2	Benzo(B) Fluoranthene	2.4	U
	Benzo(K)Fluoranthene		U
192-97-2	Benzo(E) Pyrene	1.8	U
50-32-8	Benzo(A)Pyrene	2.2	ן ע
198-55-0	Perylene Indeno(1,2,3-CD)Pyrene	2.4	ซ
193-39-5	Indeno(1,2,3-CD) Pyrene	2.0	ט
53-70-3	Dibenz (A, H) Anthracene	1.5	ט
191-24-2	Benzo(G,H,I)Perylene	2.6	ט
1			L

1B SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

16687-02

Contract No.: Lab Name: ENSECO

Lab Code: ENSECO Case No.: 16687 SAS No.: SDG No.:

Matrix: (soil/water) WATER Lab Sample ID: 16687-02

Sample wt/vol: 4090 (g/ml) ML Lab File ID: C4708

Level: (low/med) LOW Date Received: 08/28/91

% Moisture: not dec. dec. Date Extracted: 08/30/91

Date Analyzed: 09/26/91 Extraction: (SepF/Cont/Sonc) CONT

GPC Cleanup: (Y/N) N pH: 7.0 Dilution Factor: 0.122

CAS	MO	COMPOUND	CONCENTRATION	ONIIS.	MG/ L		^
CAS	NO.	COMPOUND					Q
271	-89-6	-2,3-Benzofuran		5	. 0	ט	
496-	-11-7	-2,3-Dihydroinde	ne	60		В	*
95.	-13-6	-1H-Indene		8	.7		
91·	-20-3 <i></i> -	-Naphthalene	1	16		В	
4565	-32 -6	-Benzo(B)Thiophe	ne l	4	. 6	[
91-	-22-5	-Quinoline		1	. 4	U	
120	-72-9	-1H-Indole		2	. 4	ַ	
91.	-57-6	-1H-Indole -2-Methylnaphtha	lene	4	. 8	В	
90.	-12-0	-1-Methylnaphtha:	lene		.1	l	*
92.	-52-4	-Biphenyl		2	. 5	J	*
208	-96-8	-Biphenyl		1	. 4	ט	
83.	-32-9	-Acenaphthene		15			
132	-64-9	-Dibenzofuran		1	. 0	U	
86	-73-7	-Fluorene		_	.1		*
132	-65-0	-Dibenzothiophen	e	_	. 1	U	
85	-01-8	-Phenanthrene		3	. 3	В	
120-	-12-7	-Anthracene		1	.1	ן ט	
260	-94-6	-Acridine	<u> </u>	2	. 8	ע	
86	-74-8	-Carbazole	į.	1	. 8	ע	
206	-44-0	-Fluoranthene		1	. 8	ł	
129	-00-0	-Pvrene		2	. 4	l	
56	-55-3	-Benzo(A) Anthrac	ene	2	. 4	ַ	
218	-01-9	-Chrysene	<i>-</i> 1	2	.7	ַ ד	
205	-99-2	-Benzo(B)Fluoran [,]	thene	2	. 4	U	
207	-08-9	-Benzo(K) Fluoran	thene	2	. 2	U	
192	-97-2	-Benzo(E) Pyrene		1	. 8	U	
50-	-32-8	-Benzo(A)Pyrene		2	. 2	ប	
				_	. 4	U	
193.	-39-5	-Indeno(1,2,3-CD) Pyrene	2	. 0	U	
53	-70-3	-Dibenz(A,H)Anth:	racene	1	. 6	ט	
191	-24-2	-Benzo(G,H,I)Per	ylene	2	.7	U	
I		• • • •					

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

16687-03

Lab Name: ENSECO Contract No.:

Lab Code: ENSECO Case No.: 16687 SAS No.: SDG No.:

Lab Sample ID: 16687-03 Matrix: (soil/water) WATER

Sample wt/vol: 4070 (g/ml) ML Lab File ID: C4722

Date Received: 08/28/91 Level: (low/med) LOW

Date Extracted: 08/30/91 % Moisture: not dec. dec.

Extraction: (SepF/Cont/Sonc) CONT Date Analyzed: 09/30/91

GPC Cleanup: (Y/N) N pH: 7.0 Dilution Factor: 0.123

CAS	NO.	COMPOUND		0.1.2.2.0			Q
271-	-89-6	-2,3-Benzofuran_		5.	. 0	U	
496-	-11-7	-2,3-Dihydroinde	ne	5.	. 2	В	*
95-	-13-6	-1H-Indene		0.	. 9	U	
91-	-20-3	-Naphthalene			. 0	В	
4565-	-32-6	-Benzo(B)Thiophe	ne		. 9	ט	
91-	-22-5	-Quinoline		_ :	. 4	ט	
120-	-72-9	-1H-Indole			. 5	ט	
91-	-57 - 6	-2-Methylnaphtha	lene	_	.1	В	
ı 90-	-12~()-~	-1-metnvinabntna	iene i		.7	ט	
92-	-52-4	-Biphenyl -Acenaphthylene_	·		. 2	U	
208-	-96-8	-Acenaphthylene_		-	. 4	U	
83-	-32-9	-Acenaphthene			. 3	ט	
132-	-64-9	-Dibenzofuran			. 0	U	
86-	-73-7	-Fluorene			. 0	U	
132-	-65-0	-Dibenzothiophen	e		.1	ַ	
85-	-01-8	-Phenanthrene			. 8	В	
120-	-12-7	-Anthracene		1.	.1	ט	
260-	-94-6	-Acridine			. 9	U	
86-	-74-8	-Carbazole			. 9	ַ	
206-	-44-0	-Fluoranthene		1.	. 4	ט	
129-	-00-0	-Pyrene			. 4	U	
56-	-55-3	-Benzo(A) Anthrac	ene	2.	. 5	U	
218-	-01-9	-Chrysene			. 8	ט	
205-	-99-2	-Benzo(B) Fluoran	thene		. 5	บ	
207-	-08-9	-Benzo(K)Fluoran	thene	2 .	. 3	ט	
192-	-97-2	-Benzo(E) Pyrene		1.	.9	U	
50-	-32-8	-Benzo(A)Pvrene		2.	. 3	U	
198-	-55-0	-Perylene		2.	. 5	บ	
193-	-39-5	-Perylene -Indeno(1,2,3-CD) Pyrene	2.	. 1	Ū	
53-	-70-3	-Dibenz(A,H)Anth	racene	1.	. 6	U	
191-	-24-2	-Benzo(Ġ,H,I)Per	ylene	2	. 8	Ū	

1B SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

16687-07

Lab Name: ENSECO Contract No.:

Lab Code: ENSECO Case No.: 16687 SAS No.: SDG No.:

Matrix: (soil/water) WATER Lab Sample ID: 16687-07

Sample wt/vol: 4130 (g/ml) ML Lab File ID: C4712

Level: (low/med) LOW Date Received: 08/28/91

% Moisture: not dec. dec. Date Extracted: 08/30/91

Extraction: (SepF/Cont/Sonc) CONT Date Analyzed: 09/26/91

GPC Cleanup: (Y/N) N pH: 7.0 Dilution Factor: 0.121

ara vo	CONCENTRATION	ONITS: NG/L		^
CAS NO.	COMPOUND	·		Q
	2,3-Benzofuran	1.4	J	*
496-11-7	2,3-Dihydroindene	21	В	*
95-13-6	1H-Indene	0.9	U	
91-20-3	Naphthalene	7.0	В	
4565-32-6	Benzo(B)Thiophene	0.9	U	
91-22-5	Quinoline	1.4	ַ ט	
120-72-9	1H-Indole	2.4	U	
91-57-6	2-Methylnaphthalene	5.4	В	*
90-12-0	1-Methylnaphthalene	2.5		*
92-52-4	Biphenyl	2.0	J	*
208-96-8	Biphenyl Acenaphthylene	5.2		
83-32-9	Acenaphthene	12		
132-64-9	Dibenzoruran_	1.0	ַ ד	
86-73-7	Fluorene	1.5	ſ	*
132-65-0	Dibenzothiophene	1.1	ַ	
85-01-8	Phenanthrene	2.6	В	
120-12-7	Anthracene] 1.1	U	
260-94-6	Acridine	2.8	บ	
86-74-8	Carbazole	1.8	U	
206-44-0	Fluoranthene	1.2	J	
129-00-0	Pyrene	3.0	l	
56-55-3	Benzo(A)Anthracene	2.4	U	
218-01-9	Chrysene Benzo(B)Fluoranthene	2.7	U	
205-99-2	Benzo(B) Fluoranthene	2.4	ַ ע	
207-08-9	Benzo(K)Fluoranthene	2.2	U	
192-97-2	Benzo(E)Pyrene	1.8	ַ	
50-32-8	Benzo(A)Pvrene	1 2.2	U	
198-55-0	Perylene	2.0	U	
193-39-5	Indeno(1,2,3-CD)Pyrene	2.0	U	
53-70-3	Dibenz(A,H)Anthracene	1.5	ש	
191-24-2	Benzo(G,H,I)Perylene	2.7	ט	
<u> </u>		<u> </u>	L	

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

16687-01MS

Lab Name: ENSECO Contract No.:

Lab Code: ENSECO Case No.: 16687 SAS No.: SDG No.:

Matrix: (soil/water) WATER Lab Sample ID: 16687-01MS

Sample wt/vol: 4060 (g/ml) ML Lab File ID: C4721

Level: (low/med) LOW Date Received: 08/28/91

% Moisture: not dec. dec. Date Extracted: 08/30/91

Extraction: (SepF/Cont/Sonc) CONT Date Analyzed: 09/30/91

GPC Cleanup: (Y/N) N pH: 7.0 Dilution Factor: 0.123

CAS NO.	COMPOUND	•	Q
	2,3-Benzofuran	5.0	U
496-11-7	2,3-Dihydroindene	_ 26	В
95-13-6	1H-Indene	6.9	sc
91-20-3	Naphthalene	14	B SC
4565-32-6	Benzo(B)Thiophene	0.9	ប
91-22-5	Quinoline	6.5	sc
120-72-9	1H-Indole	2.5	ן ט
91-57-6	2-Methylnaphthalene	9.5	B SC
90-12-0	1-Methylnaphthalene	2.4	*
92-52-4	Biphenyl	2.0	J *
208-96-8	Biphenyl Acenaphthylene	1.4	U
83-32-9	Acenaphthene	11	
132-64-9	Dibenzofuran	1.0	ן ט
86-73-7	Fluorene	9.0	SC
132-65-0	Dibenzothiophene	_	U
85-01-8	Phenanthrene	1.8	В
120-12-7	Anthracene	1.1	ប
260-94-6	Acridine	2.9	υ
86-74-8	Carbazole	1.7	J *
206-44-0	Fluoranthene	1.0	J
129-00-0	Pyrene	1.0	J
56-55-3	Benzo(A)Anthracene	2.5	U
218-01-9	Chrysene	_ 4.3	SC
205-99-2	Benzo(B) Fluoranthene	2.5	υ
	Benzo(K) Fluoranthene	2.3	บ
192-97-2	Benzo(E)Pyrene	1.9	ប
50-32-8	Benzo(A)Pvrene	1 2.3	U
198-55-0	Perylene	_ 2.5	ט
193-39-5	Perylene Indeno(1,2,3-CD)Pyrene	2.1	ע
53-70-3	Dibenz (A, H) Anthracene	1.6	บ
191-24-2	Benzo(G,H,I)Perylene	2.8	บ

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

16687-01MSD

EPA SAMPLE NO.

Lab Name: ENSECO Contract No.:

Lab Code: ENSECO Case No.: 16687 SAS No.: SDG No.:

Matrix: (soil/water) WATER Lab Sample ID: 16687-01MSD

Sample wt/vol: 4420 (g/ml) ML Lab File ID: C4707

Level: (low/med) LOW Date Received: 08/28/91

dec. Date Extracted: 08/30/91 % Moisture: not dec.

Extraction: (SepF/Cont/Sonc) CONT Date Analyzed: 09/26/91

GPC Cleanup: (Y/N) N pH: 7.0 Dilution Factor: 0.113

CONCENTRATION UNITS: NG/L

CAS NO.	COMPOUND	ENTRALION UNITS. NG/ L		Q
	2,3-Benzofuran	4.6	Ü	
496-11-7	2,3-Dihydroindene	51	В	*
95-13-6	1H-Indene	19	1	SC
91-20-3	Naphthalene	25	B	SC
4565-32-6	Benzo(B)Thiophene	4.2		
91-22-5	Quinoline	9.2		SC
1 120-72-0	1W-Tndole	1 23	ט	
91-57-6	2-Methylnaphthalene	14	В	SC
90-12-0	1-Methylnaphthalene_	3.4	1	*
92-52-4	Biphenyl	2.5	J	*
208-96-8	Acenaphthylene	1.3	ט	
83-32-9	Acenaphthene			
132-64-9	Dibenzofuran	0.9	ע	
86-73-7	Fluorene	10		SC
132-65-0	Dibenzothiophene	1.0	ט	
85-01-8	Phenanthrene	2.2	В	ĺ
120-12-7	Anthracene	1.0	ט	
260-94-6	Acridine	1 2.6	ט	
86-74-8	Carbazole	1.5	, ,	*
206-44-0	Fluoranthene		J	
129-00-0	Pvrene	1.3	ט	
56-55-3	Benzo(A)Anthracene	2.3	ט	
218-01-9	Chrysene	3.7	1	SC
205-99-2	Benzo(B) Fluoranthene	2.3	U	
207-08-9	Benzo(K)Fluoranthene	2.1	U	
192-97-2	Benzo(E) Pyrene	1.7	U	
50-32-8	Benzo(A)Pvrene	2.1	ט	
198-55-0	Perylene Indeno(1,2,3-CD)Pyre	2.3	ש	
193-39-5	Indeno(1,2,3-CD)Pyre	ne 1.9	ש	
53-70-3	Dibenz (A,H) Anthracen	e 1.4	ש	
191-24-2	Benzo(G,H,I)Perylene	2.6	ט	

SP = Spike Compound

WATER SEMIVOLATILE SURROGATE RECOVERY

Lab Name: ENSECO Contract:

Lab Code: ENSECO Case No.: 16687 SAS No.: SDG No.:

Level: LOW

	EPA SAMPLE NO.	S1 (NAP) #	S2 (FLU) #	S3 (CHR) #
1	16687-01	103	112	61
2	16687-02	120 *	132	92
3	16687-03	100	110	157 *
4	16687-05	155 *	138	111
6	16687-06	134 *	131	45
7	16687-07	96	112	70
8	16687-08	Ð	D	D
9	16687-09	78	98	40
10	16687-10	D	D	D
11	16687-11	D	D	D
12	16687-12	D	D	D
13	16687-13	Ð	D	D
14	16687-01MS	78	99	56
15	16687-01MSD	112 *	118	56
16	BLK01	123 *	134	139 *
17	BLK02	120 *	124	123 *
1				L

			OC LIWITS
Sl	(NAP)	= D8-NAPHTHALENE	(14-108)
S2	(FLU)	= D10-FLUORENE	(41-162)
S3	(CHR)	= D12-CHRYSENE	(10-118)

- # Column to be used to flag recovery values
- * Values outside of contract required QC limits
- D Surrogates diluted out

3C

WATER SEMIVOLATILE MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERY

Lab Name: ENSECO

Contract:

Lab Code: ENSECO Case No.: 16687 SAS No.: SDG No.:

Matrix Spike - EPA Sample No.: 16687-01 LEVEL: LOW

Compound	SPIKE	SAMPLE	MS	MS
	ADDED	CONCENTRATION	CONCENTRATION	%
	(ng/L)	(ng/L)	(ng/L)	REC
1H-Indene Naphthalene Quinoline 2-Methylnaphthalene Fluorene Chrysene Benzo(E) Pyrene	9.84 9.84 9.84 9.84 9.84 9.84	9.18 14.0 ND 4.65 0.985 ND ND	6.86 13.5 6.52 9.46 8.96 4.26 0.60	-24 -5 66 49 81 43

Compound	SPIKE ADDED (ng/L)	MSD CONCENTRATION (ng/L)	MSD % REC	* RPD
1H-Indene Naphthalene Quinoline 2-Methylnaphthalene Fluorene Chrysene Benzo(E) Pyrene	9.04 9.04 9.04 9.04 9.04 9.04	18.7 24.9 9.15 14.5 10.3 3.74 0.66	105 121 101 109 103 41	319 217 42 76 24 5

Comments:

4B SEMIVOLATILE METHOD BLANK SUMMARY

Contract:

BLK01

Lab Name: ENSECO

Lab Code: ENSECO Case No.: 16687 SAS No.: SDG No.:

Lab File ID: C4720 Lab Sample ID: BLK01

Instrument ID: 4500-C Date Extracted: 08/31/91

Matrix: (soil/water) WATER Date Analyzed: 09/30/91

Level: (low/med) LOW Time Analyzed: 1654

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS AND MSD:

	EPA SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED
1	16687-01	16687-01	C4705	09/25/91
2	16687-02	16687-02	C4708	09/26/91
3	16687-03	16687-03	C4722	09/30/91
4	16687-05	16687-05	C4723	09/30/91
5	16687-06	16687-06	C4724	09/30/91
6	16687-07	16687-07	C4712	09/26/91
7	16687-08	16687-08	C4725	09/30/91
8	16687-09	16687-09	C4714	09/26/91
9	16687-01MS	16687-01MS	C4721	09/30/91
10	16687-01MSD	16687-01MSD	C4707	09/26/91

Comments:

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

BLK01

Lab Name: ENSECO Contract No.:

Lab Code: ENSECO Case No.: 16687 SAS No.: SDG No.:

Matrix: (soil/water) WATER Lab Sample ID: BLK01

Sample wt/vol: 4000 (g/ml) ML Lab File ID: C4720

Level: (low/med) LOW Date Received: 08/28/91

% Moisture: not dec. dec. Date Extracted: 08/31/91

Extraction: (SepF/Cont/Sonc) CONT Date Analyzed: 09/30/91

GPC Cleanup: (Y/N) N pH: 7.0 Dilution Factor: 0.123

CAS NO.	COMPOUND		Q
271-89-6	2,3-Benzofuran	5.0	U
496-11-7	2,3-Dihydroindene	<u> </u>	J
95-13-6	1H-Indene	0.9	ט
91-20-3	Naphthalene	1.6	J
4565-32-6	Benzo(B)Thiophene	0.9	U
91-22-5	Quinoline		U
1 400 70 0	777		U
91-57-6	1H-Indole 2-Methylnaphthalene	1.6	
90-12-0	1-Methylnaphthalene	1.6	υ
92-52-4	Biphenyl	4.2	ט
208-96-8	Acenaphthylene		ט
83-32-9	Acenaphthene	1.3	ט
132-64-9	Dibenzofuran	1.0	U
1 86-73-7	Fluorene	1 1.0	ן ט
132-65-0	Dibenzothiophene	1.1	ט
85-01-8	Phenanthrene	2.0	
120-12-7	Anthracene		ט
260-94-6	Acridine	1 2.9	ט
86-74-8	Carbazole	1.9	ט
206-44-0	Fluoranthene		ן ט
129-00-0	Pyrene		ט
56-55-3	Pyrene Benzo(A)Anthracene		ט
218-01-9	Chrysene Benzo(B)Fluoranthene		ן ט
205-99-2	Benzo(B)Fluoranthene		ן ט
207-08-9	Benzo(K)Fluorantnene	2.3	ט
192-97-2	Benzo(E)Pyrene	1.9	ט
50-32-8	Benzo(A)Pyrene	1 2.3	ט
198-55-0	Perylene	2.5	ט
193-39-5	Indeno(1,2,3-CD)Pyrene	2.1	ע
53-70-3	Dibenz(A,H)Anthracene	1.6	ן ט
191-24-2	Benzo(G,H,I)Perylene	1.2	J

4B
SEMIVOLATILE METHOD BLANK SUMMARY

BLK02

Lab Name: ENSECO

Contract:

Lab Code: ENSECO Case No.: 16687 SAS No.: SDG No.:

Lab File ID: C4758 Lab Sample ID: BLK02

Instrument ID: 4500-C Date Extracted: 08/31/91

Matrix: (soil/water) WATER Date Analyzed: 10/08/91

Level: (low/med) LOW Time Analyzed: 1658

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS AND MSD:

	EPA	LAB	LAB	DATE
	SAMPLE NO.	SAMPLE ID	FILE ID	ANALYZED
1	16687-10	16687-10	C4726	10/01/91
2	16687-11	16687-11	C4727	10/01/91
3	16687-12	16687-12	C4728	10/01/91
4	16687-13	16687-13	C4738	10/05/91

Comments:

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

BLK02

Lab Name: ENSECO Contract No.:

Lab Code: ENSECO Case No.: 16687 SAS No.: SDG No.:

Lab Sample ID: BLK02 Matrix: (soil/water) WATER

Sample wt/vol: 4000 (g/ml) ML Lab File ID: C4758

Date Received: 08/28/91 Level: (low/med) LOW

% Moisture: not dec. dec. Date Extracted: 08/31/91

Extraction: (SepF/Cont/Sonc) CONT Date Analyzed: 10/08/91

GPC Cleanup: (Y/N) N pH: 7.0 Dilution Factor: 0.125

CAS NO.	COMPOUND	N UNIIS. NG/L	Q
271-89-6	2,3-Benzofuran	5.1	ט
	2,3-Dihydroindene	1.7	*
	1H-Indene	0.9	ט
91-20-3	Naphthalene	1.5	J *
4565-32-6	Benzo(B)Thiophene	0.9	U
91-22-5	Quinoline	1.4	U
120-72-9	1H-Tndole	1 25	U
91-57-6	2-Methylnaphthalene	1.1	*
90-12-0	1-Methylnaphthalene	1.6	U
92-52-4	Biphenyl Acenaphthylene	4.3	U
208-96-8	Acenaphthylene	1.4	ט
83-32-9	Acenaphthene	1.3	υ ,
132-64-9	Dibenzofuran	1.0	U
86-73-7	Fluorene	1.0	ט
132-65-0	Dibenzothiophene	1.1	ט
85-01-8	Phenanthrene	1.2	J
120-12-7	Anthracene	1.1	ן ט
260-94-6	Acridine	2.9	ן ט
	Carbazole	1.9	ט
206-44-0	Fluoranthene	1.4	ע
129-00-0	Pyrene	1.4	U
56-55-3	Benzo(A) Anthracene	2.5	ן ט
218-01-9	Chrysene	2.8	שׁ
205-99-2	Benzo(B)Fluoranthene	2.5	U
207-08-9	Benzo(K) Fluoranthene	2.3	ן ט
192-97-2	Benzo (E) Pyrene	1.9	ט
50-32-8	Benzo(A) Pyrene	2.3	ן ט
			U
193-39-5	Indeno(1,2,3-CD)Pyrene	2.1	U
53-70-3	Dibenz(A,H)Anthracene	1.6	U
191-24-2	Benzo(G,H,I)Perylene	2.8	U
	· · · · <u></u>	1	I .

5B SEMIVOLATILE ORGANIC GC/MS PAH

Lab Name: ENSECO Contract No:

Lab Code: ENSECO Case No: 16687 SAS No: SDG No:

THIS PERFORMANCE TUNE APPLIES TO THE FOLLOWING SAMPLES, BLANKS AND STANDARDS

SAMPLE ID	LAB FILE ID	DATE OF ANALYSIS	TIME OF ANALYSIS
40_PPB_PAH_STD	C4697	09/25/91	1245
1200_PPB_PAH_STD	C4699	09/25/91	1651
20_PPB_PAH_STD	C4700	09/25/91	1742
240_PPB_PAH_STD	C4701	09/25/91	1834
600_PPB_PAH_STD	C4702	09/25/91	1927

5B SEMIVOLATILE ORGANIC GC/MS PAH

Lab Name: ENSECO

Contract No:

Lab Code: ENSECO Case No: 16687 SAS No: SDG No:

THIS PERFORMANCE TUNE APPLIES TO THE FOLLOWING SAMPLES, BLANKS AND STANDARDS

SAMPLE ID	LAB FILE ID	DATE OF ANALYSIS	TIME OF ANALYSIS
40 PPB PAH STD	C4703	09/25/91	2018
16687-01	C4705	09/25/91	2245
16687-01MSD	C4707	09/26/91	0029
16687-02	C4708	09/26/91	0120
16687-07	C4712	09/26/91	0447
16687-09	C4714	09/26/91	0631

5B SEMIVOLATILE ORGANIC GC/MS PAH

Lab Name: ENSECO Contract No:

Lab Code: ENSECO Case No: 16687 SAS No: SDG No:

THIS PERFORMANCE TUNE APPLIES TO THE FOLLOWING SAMPLES, BLANKS AND STANDARDS

SAMPLE ID	LAB FILE ID	DATE OF ANALYSIS	TIME OF ANALYSIS
40 PPB PAH STD	C4719	09/30/91	1530
BLK01	C4720	09/30/91	1654
16687-01MS	C4721	09/30/91	1746
16687-03	C4722	09/30/91	1838
16687-05	C4723	09/30/91	1931
16687-06	C4724	09/30/91	2158
16687-08	C4725	09/30/91	2355
16687-10	C4726	10/01/91	0053
16687-11	C4727	10/01/91	0155
16687-12	C4728	10/01/91	0248

5B SEMIVOLATILE ORGANIC GC/MS PAH

Lab Name: ENSECO

Contract No:

Lab Code: ENSECO Case No: 16687 SAS No: SDG No:

THIS PERFORMANCE TUNE APPLIES TO THE FOLLOWING SAMPLES, BLANKS AND STANDARDS

SAMPLE ID	LAB FILE ID	DATE OF ANALYSIS	TIME OF ANALYSIS
40_PPB_PAH_STD	C4736	10/05/91	1348
16687-13	C4738	10/05/91	1610

5B SEMIVOLATILE ORGANIC GC/MS PAH

Lab Name: ENSECO Contract No:

Lab Code: ENSECO Case No: 16687 SAS No: SDG No:

THIS PERFORMANCE TUNE APPLIES TO THE FOLLOWING SAMPLES, BLANKS AND STANDARDS

SAMPLE ID	LAB FILE ID	DATE OF ANALYSIS	TIME OF ANALYSIS
40_PPB_PAH_STD	C4757	10/08/91	1456
BLK02	C4758	10/08/91	1658

6B INITIAL CALIBRATION DATA PAH COMPOUNDS

Lab Name: ENSECO Lab Code: ENSECO Case No: 16687

Instrument ID: 4500-C Calibration Date(s): 09/25/91

Lab File ID: RRF 240= C4701	RRF RRF (20= C470 500= C470	_	RRF RRF 1	40= C46 .200= C46		
COMPOUND	20 PPB RRF	40 PPB RRF	240PPB RRF	600PPB RRF	1200PPB RRF	AVE RRF	%RSD
2,3-Benzofuran 2,3-Dihydroindene 1H-Indene Naphthalene Benzo(B)Thiophene Quinoline 1H-Indole 2-Methylnaphthalene 1-Methylnaphthalene Biphenyl Acenaphthylene Acenaphthene Dibenzofuran Fluorene Dibenzothiophene Phenanthrene Anthracene Acridine Carbazole Fluoranthene Pyrene Benzo(A)Anthracene Chrysene Benzo(B)Fluoranthene Benzo(E)Pyrene Benzo(A)Pyrene	0.829 0.781 0.664 1.791 1.164 0.663 0.714 0.754 0.783 1.198 1.121 0.949 1.445 1.177 1.031 1.290 0.779 0.450 0.601 0.960 1.337 0.911 1.193 1.603 1.288 1.342 1.188	0.782 0.717 0.637 2.456 1.055 0.714 0.730 0.857 0.768 1.120 1.189 0.886 1.254 1.011 0.898 1.107 0.829 0.579 0.763 1.015 1.201 1.097 1.148 1.023 0.874	0.991 0.905 0.758 1.744 1.278 0.705 0.819 0.762 0.834 1.257 1.010 1.502 1.154 1.072 1.104 0.862 0.510 0.720 1.108 1.316 1.388 1.313	0.947 0.856 0.777 1.736 1.170 0.749 0.810 0.761 1.103 1.306 0.955 1.329 1.065 0.997 1.024 0.962 0.588 0.771 1.031 1.077 1.162 1.258 1.276 1.157	0.859 0.795 0.710 1.536 1.170 0.749 0.857 0.734 0.810 1.165 1.381 0.994 1.383 1.118 0.991 0.990 0.921 0.610 0.980 0.961 1.302 1.410 1.714 1.501 1.440 1.371	0.871 0.547 0.724 1.019 1.178 1.092 1.266 1.546 1.317 1.302	14.1 10.2 13.1 16.3
Perylene Indeno(1,2,3-CD)Pyrene Dibenz(A,H)Anthracene Benzo(G,H,I)Perylene	0.869 1.485 1.281 1.291	0.804 1.161 1.041 1.036	1.012 1.552 1.426 1.454	0.830 1.352 1.232 1.247	1.082 1.664 1.511 1.483		13.2 13.4 14.0 13.8
D8-Naphthalene D10-Flourene D12-Chrysene	1.427 0.928 1.014	1.234 0.840 1.009	1.524 0.921 1.123	1.534 0.848 1.107	1.347 0.916 1.183	1.413 0.891 1.087	8.9 4.8 6.9

Lab Name: ENSECO Lab Code: ENSECO Case No: 16687

Instrument ID: 4500-C Calibration Date(s): 09/25/91 Time: 2018

Lab ID: C4703 Initial Calibration Date: 09/25/91

	INITIAL	40 PPB	%D
COMPOUND	AVE RRF	RRF	ا مو
2 2 Paractives			
2,3-Benzofuran	0.882	0.716	18.8
2,3-Dihydroindene 1H-Indene	0.811	0.645	20.5
	0.709	0.563	20.6
Naphthalene	1.853	1.642	11.4
Benzo(B) Thiophene	1.167	1.168	-0.1
Quinoline	0.716	0.650	9.2
1H-Indole	0.786	0.689	12.3
2-Methylnaphthalene	0.762	0.702	7.9
1-Methylnaphthalene	0.791	0.762	3.7
Biphenyl	1.169	1.151	1.5
Acenaphthylene	1.247	1.056	15.3
Acenaphthene	0.959	0.902	5.9
Dibenzofuran	1.383	1.366	1.2
Fluorene	1.105	1.051	4.9
Dibenzothiophene	0.994	0.987	0.7
Phenanthrene	1.103	1.110	-0.6
Anthracene	0.871	0.758	13.0
Acridine	0.547	0.457	16.5
Carbazole	0.724	0.623	14.0
Fluoranthene	1.019	0.986	3.2
Pyrene	1.178	1.266	-7.5
Benzo(A) Anthracene	1.092	0.953	12.7
Chrysene	1.266	1.200	5.2
Benzo(B) Fluoranthene	1.546	1.423	8.0
Benzo(K) Fluoranthene	1.317	1.368	-3.9
Benzo(E) Pyrene	1.302	1.323	-1.6
Benzo(A) Pyrene	1.181	0.969	18.0
Perylene	0.919	0.874	4.9
Indeno(1,2,3-CD)Pyrene	1.443	1.300	9.9
Dibenz (A, H) Anthracene	1.298	1.223	5.8
Benzo(G,H,I)Perylene	1.302	1.235	5.1
D8-Naphthalene	1.413	1.440	-1.9
D10-Flourene	0.891	0.877	1.6
D12-Chrysene	1.087	1.039	4.4

Lab Name: ENSECO Lab Code: ENSECO Case No: 16687

Instrument ID: 4500-C Calibration Date(s): 09/30/91 Time: 1530

Lab ID: C4719 Initial Calibration Date: 09/25/91

COMPOUND	INITIAL AVE RRF	40 PPB RRF	%D
2,3-Benzofuran	0.882	1.111	-26.0
2,3-Dihydroindene	0.811	1.024	-26.3
1H-Indene	0.709	0.855	-20.6
Naphthalene	1.853	2.238	-20.8
Benzo(B)Thiophene	1.167	1.251	-7.2
Quinoline	0.716	0.628	12.3
1H-Indole	0.786	0.553	29.6
2-Methylnaphthalene	0.762	0.705	7.5
1-Methylnaphthalene	0.791	0.735	7.1
Biphenyl	1.169	1.195	-2.2
Acenaphthylene	1.247	1.390	-11.5
Acenaphthene	0.959	0.903	5.8
Dibenzofuran	1.383	1.147	17.1
Fluorene	1.105	1.006	9.0
Dibenzothiophene	0.994	1.032	-3.8
Phenanthrene	1.103	1.088	1.4
Anthracene	0.871	0.836	4.0
Acridine	0.547	0.578	-5.7
Carbazole	0.724	0.487	32.7
Fluoranthene	1.019	1.065	-4.5
Pyrene	1.178	1.329	-12.8
Benzo(A) Anthracene	1.092	0.904	17.2
Chrysene	1.266	1.159	8.5
Benzo(B) Fluoranthene	1.546	1.255	18.8
Benzo(K) Fluoranthene	1.317	1.158	12.1
Benzo(E) Pyrene	1.302	1.326	-1.8
Benzo(A) Pyrene	1.181	1.108	6.2
Perylene	0.919	0.755	17.8
Indeno(1,2,3-CD)Pyrene	1.443	1.294	10.3
Dibenz (A, H) Anthracene	1.298	1.165	10.2
Benzo(G,H,I)Perylene	1.302	1.310	-0.6
D8-Naphthalene	1.413	1.448	-2. 5
D10-Flourene	0.891	0.824	7.5
D12-Chrysene	1.087	0.878	19.2

Lab Name: ENSECO Lab Code: ENSECO Case No: 16687

Instrument ID: 4500-C Calibration Date(s): 10/05/91 Time: 1348

Lab ID: C4736 Initial Calibration Date: 09/25/91

COMPOUND	INITIAL AVE RRF	40 PPB RRF	%D
2,3-Benzofuran	0.882	0.748	15.2
2,3-Dihydroindene	0.811	0.835	-3.0
1H-Indene	0.709	0.724	-2.1
Naphthalene	1.853	2.001	-8.0
Benzo(B)Thiophene	1.167	1.415	-21.3
Quinoline	0.716	0.891	-24.4
1H-Indole	0.786	0.779	0.9
2-Methylnaphthalene	0.762	0.845	-10.9
1-Methylnaphthalene	0.791	0.890	-12.5
Biphenyl	1.169	1.366	-16.9
Acenaphthylene	1.247	1.633	-31.0
Acenaphthene	0.959	1.200	-25.1
Dibenzofuran	1.383	1.673	-21.0
Fluorene	1.105	1.346	-21.8
Dibenzothiophene	0.994	1.133	-14.0
Phenanthrene	1.103	1.182	-7.2
Anthracene	0.871	0.954	-9.5
Acridine	0.547	0.626	-14.4
Carbazole	0.724	0.710	1.9
Fluoranthene	1.019	1.190	-16.8
Pyrene	1.178	1.484	-26.0
Benzo(A) Anthracene	1.092	1.077	1.4
Chrysene	1.266	1.207	4.7
Benzo(B) Fluoranthene	1.546	1.366	11.6
Benzo(K) Fluoranthene	1.317	1.226	6.9
Benzo(E) Pyrene	1.302	1.084	16.7
Benzo(A) Pyrene	1.181	1.104	6.5
Perylene	0.919	0.876	4.7
Indeno(1,2,3-CD)Pyrene	1.443	1.243	13.9
Dibenz (A, H) Anthracene	1.298	1.108	14.6
Benzo(G,H,I)Perylene	1.302	1.182	9.2
	=======		=====
D8-Naphthalene	1.413	1.480	-4.7
D10-Flourene	0.891	0.969	-8.8
D12-Chrysene	1.087	0.824	24.2

Lab Name: ENSECO Lab Code: ENSECO Case No: 16687

Instrument ID: 4500-C Calibration Date(s): 10/08/91 Time: 1456

Lab ID: C4757 Initial Calibration Date: 09/25/91

	I		
	INITIAL	40 PPB	∦D
COMPOUND	AVE RRF	RRF	
2,3-Benzofuran	0.882	1.056	-19.7
2,3-Dihydroindene	0.811	0.900	-11.0
1H-Indene	0.709	0.799	-12.7
Naphthalene	1.853	1.955	-5.5
Benzo(B) Thiophene	1.167	1.414	-21.2
Quinoline	0.716	0.611	14.7
1H-Indole	0.786	0.606	22.9
2-Methylnaphthalene	0.762	0.782	-2.6
1-Methylnaphthalene	0.791	0.901	-13.9
Biphenyl	1.169	1.285	-9.9
Acenaphthylene	1.247	1.648	-32.2
Acenaphthene	0.959	1.140	-18.9
Dibenzofuran	1.383	1.479	-6.9
Fluorene	1.105	1.248	-12.9
Dibenzothiophene	0.994	1.276	-28.4
Phenanthrene	1.103	1.371	-24.3
Anthracene	0.871	1.111	-27.6
Acridine	0.547	0.564	-3.1
Carbazole	0.724	0.798	-10.2
Fluoranthene	1.019	1.348	-32.3
Pyrene	1.178	1.509	-28.1
Benzo(A) Anthracene	1.092	1.310	-20.0
Chrysene	1.266	1.426	-12.6
Benzo(B) Fluoranthene	1.546	1.484	4.0
Benzo(K) Fluoranthene	1.317	1.492	-13.3
Benzo(E) Pyrene	1.302	1.264	2.9
Benzo(A) Pyrene	1.181	1.234	-4.5
Perylene •	0.919	1.053	-14.6
Indeno(1,2,3-CD)Pyrene	1.443	1.316	8.8
Dibenz(A,H)Anthracene	1.298	1.229	5.3
Benzo(G,H,I)Perylene	1.302	1.301	0.1
D8-Naphthalene	1.413	1.539	-8.9
D10-Flourene	0.891	0.934	-4.8
D12-Chrysene	1.087	0.938	13.7
		<u></u>	<u> </u>

Lab Name: ENSECO Contract:

Lab Code: ENSECO Case No: 16687 SAS No.: SDG No:

Lab File ID (Standard): C4703 Date Analyzed: 09/25/91

Instrument ID: 4500-C Time Analyzed: 2018

	IS#1 (ACN) AREA #	IS#2 (PHN) AREA #	IS#3 (BAP) AREA #
12 HOUR STD	312000	479000	392000
UPPER LIMIT	624000	958000	784000
LOWER LIMIT	156000	248000	196000
SAMPLE NO.			
16687-01 16687-02 16687-07 16687-09 16687-01MSD	384000 256000 275000 210000 364000	608000 409000 422000 333000 581000	370000 200000 196000 219000 406000

IS#1 (ACN) = D10-ACENAPHTHENE UPPER LIMIT = + 100%
IS#2 (PHN) = D10-PHENANTHRENE of internal standard area
IS#3 (BAP) = D12-BENZO(A) PYRENE LOWER LIMIT = - 50%

of internal standard area

Lab Name: ENSECO Contract:

Lab Code: ENSECO Case No: 16687 SAS No.: SDG No:

Date Analyzed: 09/30/91 Lab File ID (Standard): C4719

Instrument ID: 4500-C Time Analyzed: 1530

	IS#1 (ACN) AREA #	IS#2 (PHN) AREA #	IS#3 (BAP) AREA #
12 HOUR STD	335000	488000	425000
UPPER LIMIT	670000	976000	850000
LOWER LIMIT	168000	244000	212000
SAMPLE NO.			
16687-03 16687-05 16687-06 16687-08 16687-10 16687-11 16687-12 16687-01MS BLK01	618000 304000 179000 292000 449000 355000 495000 693000 412000	993000 414000 247000 448000 782000 721000 769000 1190000 823000	560000 251000 184000 352000 705000 834000 743000 715000 723000

IS#1 (ACN) = D10-ACENAPHTHENE

UPPER LIMIT = + 100%
of internal standard area IS#2 (PHN) = D10-PHENANTHRENE

IS#3 (BAP) = D12-BENZO(A) PYRENE LOWER LIMIT = - 50%

of internal standard area

Lab Name: ENSECO Contract:

Lab Code: ENSECO Case No: 16687 SAS No.: SDG No:

Lab File ID (Standard): C4736 Date Analyzed: 10/05/91

Instrument ID: 4500-C Time Analyzed: 1348

	IS#1 (ACN) AREA #	IS#2 (PHN) AREA #	IS#3 (BAP) AREA #
12 HOUR STD	2400000	4220000	4110000
UPPER LIMIT	480000	8440000	8220000
LOWER LIMIT	1200000	2110000	2060000
SAMPLE NO.			
16687-13	2030000	3590000	3480000

IS#1 (ACN) = D10-ACENAPHTHENE UPPER LIMIT = + 100% of internal standard area

IS#3 (BAP) = D12-BENZO(A) PYRENE LOWER LIMIT = - 50%

of internal standard area

Lab Name: ENSECO Contract:

Lab Code: ENSECO Case No: 16687 SAS No.: SDG No:

Lab File ID (Standard): C4757 Date Analyzed: 10/08/91

Instrument ID: 4500-C Time Analyzed: 1456

	IS#1 (ACN) AREA #	IS#2 (PHN) AREA #	IS#3 (BAP) AREA #
12 HOUR STD	276000	370000	342000
UPPER LIMIT	552000	740000	684000
LOWER LIMIT	138000	185000	171000
SAMPLE NO.			
BLK02	362000	511000	424000

UPPER LIMIT = + 100% IS#1 (ACN) = D10-ACENAPHTHENE IS#2 (PHN) = D10-PHENANTHRENE IS#3 (BAP) = D12-BENZO(A) PYRENE of internal standard area

LOWER LIMIT = - 50%

of internal standard area

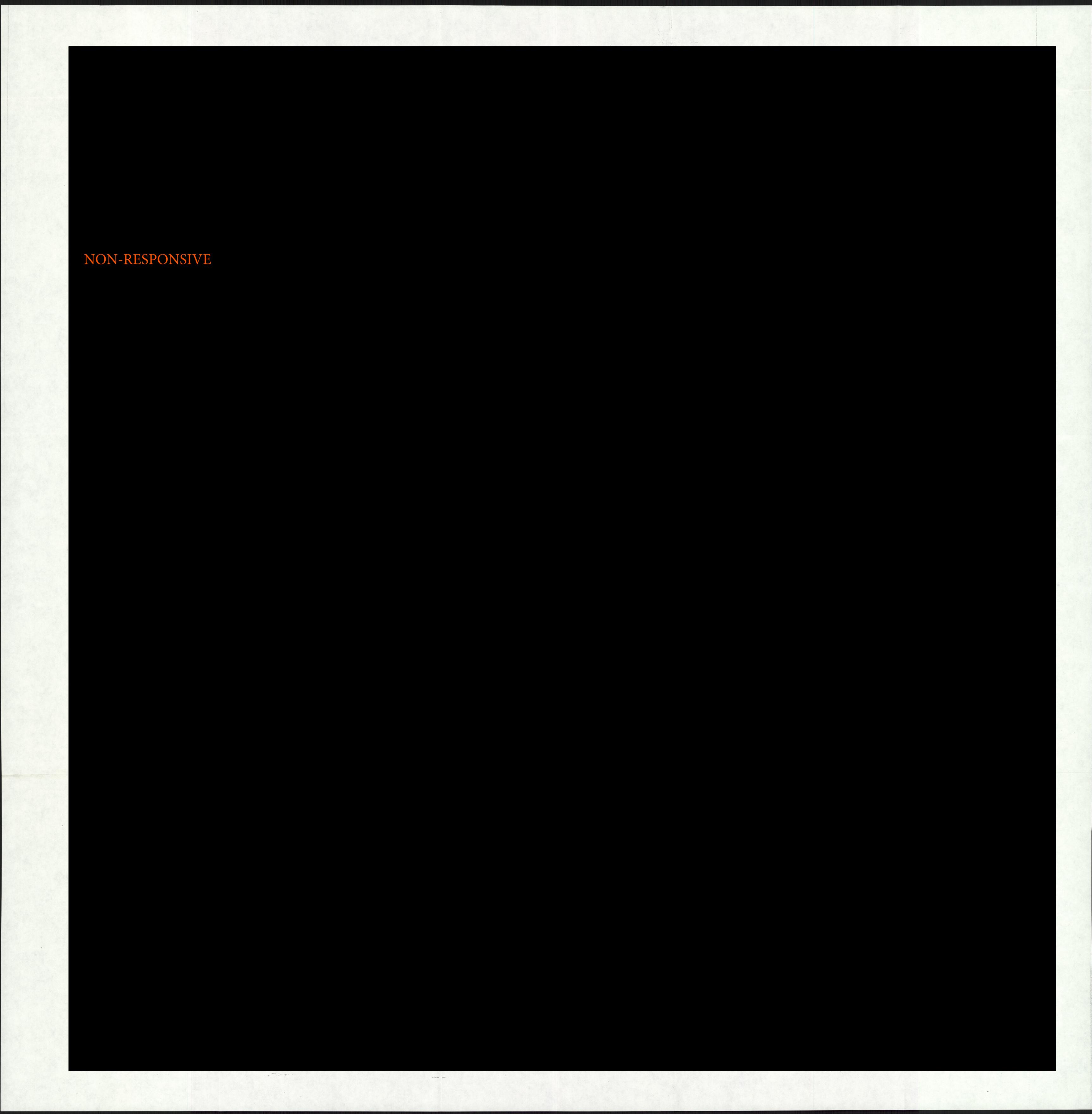
NON-RESPONSIVE

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NON-RESPONSIVE

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THIRD QUARTER, 1991



NON-RESPONSIVE